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POPULATION PHENOMENA IN AMSTERDAM

By Dr. J. H. van ZANTEN *and* T. van den BRINK

MULTIPLE BIRTHS

The *number* of multiple births decreases. We found per 100 births in:

1850–59	1·36	1890–99	1·26
1860–69	1·43	1900–09	1·32
1870–79	1·28	1911–20	1·23
1880–89	1·23	1921–30	1·20

These numbers do not deviate much from those of Bremen,[1] where from 1850 the decrease was from about 1·70 to 1·10. Among the later children relatively more twins are born than in the beginning of the family formation. Therefore it is not astonishing that the number of twins declines with the families becoming smaller. However, this is not the case for triplets, because since 1895 the twins and the triplets are distributed as follows:

PER 10,000 BIRTHS

Periods	Twins	Triplets
1895–99	124	0·8
1900–09	129	1·0
1911–20	121	1·2
1921–30	122	1·4

In this period of thirty-six years two quadruplets have been born, which means one per 250,000 births; however, both were immature.

For the whole country the frequency for twins somewhat outnumbers this rate (in the years 1921–30, 133 per 10,000 births), which can be explained by the fact that in the smaller communities the average number of children per family is bigger. The number of triplets in the country in those years was 1·3 per 10,000 births, and three quadruplets were born.

It is a well-known fact that twins and triplets, which are often born with more difficulties than single-births, show a greater number of *still-births* than the last-mentioned. Their number remained in Amsterdam till 1920 almost on the same level; since that date, here, too, a decrease can be stated. In 1850–59 we find 14·7 per cent still-births among twins; in 1911–20 still 13·5 per

[1] 100 *Jahre Geburtenstatistik in Bremen*, p. 10.

cent; in 1921–30, however, only 9·1 per cent. During this period the percentage for the aggregate births declined from 6·1 to 3·4.

The fact that the percentage of twins for illegitimate children is smaller than among the aggregate births can once more be explained by the fact that those children are mainly firstlings, among whom less twins occur. For the whole period 1850–1930, 5·17 per cent of the twin- and triplet-births were illegitimate, for the aggregate born children during the same period this rate was 5·39 per cent.

As to the *proportions of the two sexes*, according to the following table, the surplus of boys has been bigger for twin-births than for the aggregate born children, but this seems to have changed lately. The triplets, for which we have only very small numbers, show quite different ratios.

	Number of Boys per 100 Girls among		
	The Aggregate Born Children	Twin-births	Triplet-births
1895–1910	105·3	110·5	120·0
1911–1920	105·4	105·5	96·1
1921–1930	106·0	104·5	63·7

It is possible that, with the above-mentioned decrease of the number of still-births among twins, the chances of dying off of female embryos in the first months after the conception (see above) have declined too; from which fact the lower surplus of boys might be explained.

With regard to the *composition* of the twins and triplets, we have to distinguish biniovular and uniovular cells. From the latter the children are always of the same sex. The ratio between those two categories is unknown. The number of uniovular cell twin-births cannot be preponderant, for once more it appears (as formerly) that the number of twins of unequal sex is the bigger. Namely, out of 6,317 twins born between 1895 and 1930, 2,235 consisted of a boy and a girl, 2,155 of two boys, and 1,927 of two girls, from which figures the surplus of boys once again strikes us. Strictly speaking, we ought to discriminate five groups, namely, biniovular cells of different sex, biniovular cells composed of two boys or two girls, uniovular cells composed of two boys or two girls. But the data to fix the extent of these five groups are not available.

The records about twin-births in the whole country agree with the above-mentioned data.

Finally, it might be recorded that the number of multiple births increases with the consecutive deliveries, namely, from about ten per thousand for firstlings to about fifteen for the fourth children, and sometimes even twenty for the later-born children.

AGE AND AGE-DIFFERENCE OF THE PARENTS

The age of the parents of 376,510 legitimate children, born in twenty-seven years of the period 1898–1930, is known.

If we consider first of all the age of the father and of the mother separately, it appears that the percentage of children with a father under 35 and that of children with a mother under 30 increases, a consequence of the fact that parents above these ages have gradually fewer children.

PROPORTION OF CHILDREN BORN TO YOUNGER PARENTS

(*Percentages*)

Period	Father under 35	Mother under 30
1898–1909	65·7	49·7
1911–15	68·5	53·4
1916–20	69·6	54·8
1921–25	70·1	55·5
1926–30	69·3	55·1

If we wish to compare such-like figures for Amsterdam with those for foreign towns, we have to eliminate first of all the influence of the divergency in age distribution and the divergency in marriage-frequency in the different age-groups. We find for Amsterdam:

Age of Mothers	Number of Births per Thousand Mothers in the Years				Percentage Decline in Fertility-rate since 1898–1901
	1898–1901	1906–13	1916–25	1929–32	
Under 20 years	609·3	758·2	603·6	534·6	12
20–24 years ..	474·7	444·8	355·5	288·5	39
25–29 years ..	372·3	302·9	244·7	190·1	49
30–34 years ..	279·7	210·9	172·5	126·7	55
35–39 years ..	207·4	152·7	113·1	78·4	62
40–44 years ..	100·9	72·2	50·9	32·5	68
45–49 years ..	12·0	7·9	5·4	3·3	73

By analysing this table we find, in all the ages, a decrease of the fertility, which mounts with the decline of age. It is noteworthy that the very youngest mothers have 12 per cent less children than thirty years ago, and the fact that this rate has fallen down to 50 per cent for mothers of 35 demonstrates a strong decrease of large families and corresponds exactly with the fact, which Dr. J. Sanders has found in another way for Rotterdam.[1]

For a few foreign towns some similar figures are given on page 7.[2]

It appears clearly from this statement that Amsterdam returns still very high birth-rates, compared with other big towns. If one wants to get a clear image of the decrease of fertility of the mother with her growing age, one ought to calculate this rate for every year of age, as has been done in Gini's article, already mentioned, and in that of Lasorsa in the Hungarian review.[3] For Amsterdam such data are not at our disposal.

We get a still deeper insight in this question if we combine the ages of the father and of the mother. Then it will be evident that most of the children are born when both the parents are 25–29, whereas most of the marriages take place (see Vol. II, No. 3, page 29) when the man is 25–29 and the woman 20–24. And this difference is comprehensible, as in the first group also a number of second and later-born children figure. Then comes the group where both parents are 30–34, in which group still a number of firstlings are born, but a greater number of second, third, and later-born children. The next group is sometimes (1911–20 and 1921–25) father 25–29, mother 20–24, sometimes (1916–20 and 1926–30) father 30–34, mother 25–29.

Here, too, we are able to compute the fertility rates, as the census gives us the number of married couples of the different combined ages of husband and wife. These data are given in the table on page 8.

In every group we see a decline of the fertility, except in the years 1920 and 1921 for the youngest couples. Probably the records of these years are influenced by the low birth-rates in the preceding war, as a consequence of the mobilization of our country and the serious grippe epidemic in 1918 and 1919.

[1] Dr. J. Sanders, *The Declining Birth-rate in Rotterdam*, The Hague, 1931.

[2] Gini gives such figures for several countries and towns, but for earlier years, in *Metron*, XI, 3, pp. 1–63 (1934).

[3] G. Lasorsa, "Fertilità e fecondità della donna secondo l'età," in *Journal de la Société Hongroise de Stat.*, 1935, pp. 18 ff.

NUMBER OF LIVE AND STILL-BIRTHS PER 1,000 MARRIED MOTHERS

Town	Period	Age of Mothers						
		15–19 Years	20–24 Years	25–29 Years	30–34 Years	35–39 Years	40–44 Years	45–49 Years
Amsterdam	1929–32	534·6	288·5	190·1	126·7	78·4	32·5	3·3
Zürich	1929–32	354·0	227·0	165·0	96·0	45·0	13·0	1·0
Prague	1929	315·3	180·6	113·6	59·6	26·4	7·3	1·2
Hamburg	1923–27	571·6	269·8	144·0	84·1	38·9	7·3	
Stockholm	1929–32	525·0	204·0	124·5	71·8	36·6	12·4	1·1
Copenhagen	1926–30	521·7	233·7	138·8	87·3	48·2	17·7	1·6
Milan	1929–33	331·8	243·8	161·8	97·9	56·8	18·0	1·9
Naples	1933	789·6	393·3	335·3	275·7	201·7	88·3	9·6

Whereas in 1909–10 67 per cent of the very young couples got a child, which means on the average one every eighteen months, this percentage is nowadays about 60 per cent; couples of 20–25

ANNUAL AVERAGE NUMBER OF BIRTHS PER 100 COUPLES

	Father's Age 20–24 Years				Father's Age 25–29 Years				
	Mother's Age				Mother's Age				
	–20 Years	20–24 Years	25–29 Years	30–34 Years	–20 Years	20–24 Years	25–29 Years	30–34 Years	35–39 Years
1909–10	67	50	41·5	40	67	40	30	26	26
1920–21	69	42	35	22	44	34	26	22	16
1930–31	62	35	29	25	44	27	21	20	14

	Father's Age 30–34 Years				
	Mother's Age				
	20–24 Years	25–29 Years	30–34 Years	35–39 Years	40–44 Years
1909–10	38	27	21	17	10·5
1920–21	31	21	18	16	10
1930–31	27	18	13·5	11	5

	Father's Age 35–39 Years					Father's Age 40–44 Years			
	Mother's Age					Mother's Age			
	20–24 Years	25–29 Years	30–34 Years	35–39 Years	40–44 Years	25–29 Years	30–34 Years	35–39 Years	40–44 Years
1909–10	40	27	19	16	9	47	18	13	8
1920–21	30	22	15	11	7	22	15	9	5
1930–31	29	16	11	8	4	18	10	7	3

years in 1909–10 average every two years, nowadays every three years (35 per cent); father 25–29, mother 20–24 years in 1909–10 every two and a half years, nowadays every four years; father of 30–34 years, mother 25–29 in 1909–10 every four, nowadays every five and a half years; for the other couples the percentage has decreased to half.

The age of the unmarried mother, too, shows a deviation, as appears from the following table:

AGE DISTRIBUTION OF UNMARRIED MOTHERS
(*Percentages*)

Period	–20	24–24	25–29	30–34	All
1898–1909	16·3	40·3	21·6	11·4	100
1911–15	19·7	39·0	19·3	10·8	100
1916–20	17·2	40·9	21·4	11·4	100
1921–25	17·1	35·6	23·2	11·7	100
1926–30	13·5	35·7	23·9	14·5	100

Hence we can conclude that there is a decrease of the number of unmarried young mothers (which fact indicates without any doubt an increasing use of preventatives and interruptions of pregnancy). The number of older mothers, on the contrary, shows an increase (which shows an increasing concubinage; see hereon the section on firstlings and later-born children). We further can state that the number of *very* young unmarried mothers rises (in 1918–20, among those under 20, 7 per cent were under 17 years; for 1926–30 this rate is 11 per cent).

RELIGION OF THE PARENTS

Our investigation on the changes of the birth-rates would not be complete if we do not discuss the different religions and their influence in this study, as it is a well-known fact that the opinions on birth-control are strongly connected with the different religions.

We can only calculate the birth-rates and the fertility-rates in relation to the different religions of the parents in the years just before and just after the census (we met with the same difficulty when we were dealing with the age-difference of the parents), as only the census gives us the number of members of the different denominations. The fertility-rates are as follows:

Periods	Legitimate Births per 1,000 Married Women 15–49 Years for			
	Protestants	Roman Catholics	Jews	No Religion
1899–1900	234·4	246·6	196·8	46·2
1907–12	179·8	212·3	155·2	65·8
1918–23	164·4	199·2	127·0	41·8
1929–32	133·6	171·4	87·2	47·3

The figures show a decrease for all the religions, but the smallest for Roman Catholics. Since the beginning of our century the fertility-rate for Roman Catholics has declined by 30 per cent, the rate for Protestants by 42 per cent, the rate for Jewish people even by 50 per cent. The persons without any religion show practically in every period the same, very low, figures. This is probably due to the fact that some of them shown by the census as belonging to no Church, at the notification of the birth of their child described themselves as belonging to one of the religions. So that for this group the number of births will be too low and the number of mothers too high.

We further have to take into account that in the group "Protestants" several clerical denominations are included which do not have the same opinion about birth-control; the fertility-rate for "orthodox" Protestants was 150·9, whereas the same rate for Lutherans was only 89·5.

ORDER OF SUCCESSION OF THE BIRTHS IN THE SAME FAMILY

Firstlings

In many aspects the firstlings form a special category. Not only because they show biologically a few divergencies from the later-born children, but also because they represent a special domain of morality statistics. They offer the means to answer the question whether, and to what extent, promiscuity has taken place before the marriage, as this can be concluded from the lapse of time between the marriage and the birth of the child.

We can distinguish firstlings in regard to the matrimony and in regard to the mother. In the first group a number are included which are not really firstlings, namely, those of marriages where one of the parents, or both, have had already children from a preceding marriage; as to the second group, the legitimate and the illegitimate children can be distinguished.

In regard to still-births, the firstlings show a biological deviation from the later-born children. It is a well-known fact that for them the chance of being born alive is smaller than for later-born children, and especially that the older the mother is at the moment when her firstling is born the smaller this chance becomes. Whereas in the years 1911–15 3·5 per cent of the later-born children have been notified dead, for the firstlings this percentage

was 4·6. In the years 1926–30 they were for still-births 2·4 and 2·9 respectively. According to the age of the mother, the percentages were as follows:

DEAD BORN PER 100 FIRSTLINGS OF THE MOTHER

Age of the Mother	1911–15	1921–25	1926–29
–20 years ..	4·1	3·9	1·6
20–24 years ..	3·4	3·4	1·8
25–29 years ..	3·9	4·3	2·5
30–34 years ..	7·8	8·0	5·6
35–39 years ..	10·7	12·9	8·0
40–44 years ..	15·2	19·0	15·3
45–49 years ..	37·5	21·0	25·0

The most important question is the *ratio* of the number of firstlings to *aggregate* births; the percentage of firstlings gives a first indication about the marriage fertility. If we notice how in 1906 only 26 per cent of the born children were firstlings, in 1920 already 32 per cent, and in 1930 more than 34 per cent (we are considering here the firstlings of the marriage), we may conclude that a decline has taken place of the average number of children born in one and the same family. Indeed, the percentage of 34 is not even high; in foreign countries higher rates are recorded. In 1930 we find in Warsaw, for instance, 40 per cent for Christians and 39 for non-Christians; in Nürnberg in 1933, 44; in Hamburg in 1929, 52; in Zürich in 1933, even 55.[1]

It is evident that this percentage decreases with the age of the mother. The course of this phenomenon is given in the following table:

Age of Female	Percentage of Firstlings among Children born from Married Women in	
	1911–15	1929–30
–20 years	85	85
20–24 years	55	59
25–29 years	30	40
30–34 years	15	20
35–39 years	7	10
40–44 years	5	7
45– years	3	

[1] See for other foreign towns p. 18.

The intensity with which the married have children appears more clearly if one compares the firstlings born in a certain year with the number of marriages contracted in the preceding year, which method might not be quite exact, while only 45 per cent of the firstlings are born in the first matrimonial year, but it gives a sufficiently clear image of the ratio.

Period	Number of Marriages contracted in the preceding Year	Number of Firstlings (the Still-Births included)	
		Total	Per cent
1911–15	24,340	18,406	75·6
1916–20	27,582	20,937	75·9
1921–25	34,675	23,318	67·2
1926–30	31,046	21,837	70·3

It appears from this table that the general decrease of the birth-rates starts already at the first child. However, the picture becomes clearer if we calculate the same ratio for the marriages contracted by women of different age-groups.

Age of the Female	Marriages in the Years		Firstlings in the Year after that of the Marriage		Percentages	
	1910–14	1928–29	1911–15	1929–30	1911–15	1929–30
–24	12,649	3,232	10,321	1,908	82	59
25–29	6,602	1,713	6,382	1,613	97	94
30–34	2,424	626	2,416	611	99·5	98
35–39	1,089	294	793	184	73	63
40–44	626	287	223	56	23	18
45–	422		16			

Here, too, we notice a decrease in all the age-groups, from which we may conclude that the percentage of marriages which remain childless increases. This supposition is confirmed by the result of the study about marriage fertility made during the Netherlands census of 1930; it appeared[1] that, in Amsterdam, from the families where the mother had been married before the age of 25, 4·2 per cent of the marriages contracted in the period 1886–90, and 5·9 per cent of the marriages contracted in the period 1906–10, remained childless.

[1] See Table 37b of the Statistical Communication No. 100 of the Municipal Bureau of Statistics.

A phenomenon closely connected herewith is the increasing lapse of time after the marriage before the birth of the first child. Whereas in the period 1911–15 59·8 per cent of the firstlings are born in the first year after the marriage, in the period 1916–20 this rate was 56·3 per cent, in 1921–25 51·4 per cent, and in 1926–30 only 45·4 per cent.

We are able to study this matter still deeper. As to the matrimonial duration at the moment of the birth of the firstling, three periods may be discriminated.

(*a*) The first seven months after the marriage, from which group the children are certainly conceived before the marriage, and we even may add half of the children born in the eighth and ninth month.

(*b*) The period during which the children conceived immediately after the marriage are born, thus the tenth month, and we are entitled to add the other half of the children born in the eighth and ninth month, as being born prematurely (seven and eight months children).

(*c*) The children born after the tenth month of the marriage.

If we make this division, we find that out of 100 firstlings the following belong to the various groups:

Period	Group A	Group B	Group C
1914–20	31·8	12·3	55·9
1921–25	28·8	11·1	60·1
1926–30	27·0	8·6	64·4

From 1900, however, another subdivision has been made, which does not give such a clear image, but, nevertheless, shows the changes since the beginning of this century in a satisfactory way as follows:

Period	Percentage of Firstlings Born after a Matrimonial Duration of						
	–6 Months	6–8 Months	9–11 Months	1–4 Years	5–9 Years	10 Years and more	Total
1900–01	25·8	12·1	27·0	32·5	2·0	0·6	100
1911–15	24·3	11·3	24·2	39·7		0·5	100
1916–20	24·0	11·0	21·3	39·8	2·4	0·5	100
1921–25	21·9	9·4	20·1	44·5	3·5	0·6	100
1926–30	21·3	8·0	16·1	47·4	6·5	0·7	100

It appears sufficiently from both tables:

(1) That the children not conceived before the marriage are born after an increasing lapse of time; only 8·6 per cent of these children (twenty years ago 12·6 per cent) are conceived immediately after the marriage, and more than 60 per cent of the marrying couples wait a little before they get their first child. This confirms entirely what Sanders has found for the Rotterdam families in his study, already mentioned.[1]

(2) That fewer children are conceived before the marriage; in other words, that continually fewer forced marriages take place, without any doubt influenced by the increasing use of preventatives or provoked abortion.

It is important to see the extent of this phenomenon in relation to the different *religions*. Then it becomes evident that the greater part of the forced marriages are mixed marriages and that they occur the least in Roman Catholic families.

Religion	Percentage of Firstlings Born		
	Within 6 Months		After 1 year of Married Life
	1921–25	1926–30	1926–30
Both parents Protestant	19·4	18·2	58·8
Both parents Roman Catholic ..	14·9	14·4	52·7
Both parents Jews	16·1	15·9	62·5
Protestant with Roman Catholic ..	33·5	31·5	47·1
The remainder	27·6	27·2	50·6

So we can state a decrease in all the groups. It is noteworthy that the percentage of children born after one year in families where father and mother have the same religion is the smallest for Roman Catholics, the greatest for Jewish people.

ORDER OF SUCCESSION OF THE CHILDREN BORN IN ONE AND THE SAME FAMILY

Firstlings and Later-Born Children

If one notes at the birth registration the order of the child in the family, one obtains one of the means to determine

[1] Loc. cit., pp. 103 ff.

the marriage fertility, and this is a more detailed way than the manipulation of the percentage of firstlings mentioned in the preceding.

As Kiaer[1] and Körösi[2] have stated already a long time ago, there are still two other ways, namely:

Second method: The statement of the number of children of all the couples at the census (or at another occasion where data are collected about the families, as Sanders did with 25,000 families in Rotterdam, from which data he made the publication already often mentioned).

Third method: The statement of the number of children of a marriage which has been ended by the death of one of the partners at the notification of decease of this partner.

Gini[3] has consecrated an elaborate study to the problems which arise from the determination of the marriage fertility when every one of these three methods is used.

The data obtained in these ways are of totally different character. A statement of all the families at the same time (second method) involves those where child-bearing finished long ago, as well as those where child-bearing has only been stopped recently, and those where procreation is still going on or has only begun. An average fertility-rate of all those families includes, therefore, different periods, in which the circumstances and opinions might be quite different. If we take only the cases of terminated family-forming, in other words, couples where the woman is older than 44 or 49, we meet the objection which, amongst others, could be made against the investigation of Sanders, namely, that families remain out of consideration which are dissolved by decease just before the census—probably after having lasted but a short time—and which, nevertheless, have to be taken into consideration for the calculation of the average fertility.

This last objection is not valid for the statement at decease (third method), though we still have to face here the difficulty first mentioned, namely, that the children of a person dying at

[1] Kiaer, "Fécondité des mariages," *Bulletin de l'Inst. Intern. de Stat.*, XV (1906), 2, p. 398.

[2] J. de Körösi, "Fécondité des mariages," *Bulletin de l'Inst. Intern. de Stat.*, XV (1906), 2, pp. 402 ff.

[3] Corrado Gini, "Sur la mesure de la fécondité des mariages," *Bulletin de l'Institt. Intern. de Stat.*, XXVII (1934), 2, pp. 40 ff., and the earlier articles mentioned before by the same author.

a good old age have been born a long time ago, and vice versa, so that the material obtained in both these ways is not very homogeneous.

The data obtained relating to the order of succession of birth (first method) are of a different character. If one knows how many first, second, third, etc., children are born in a certain year, one can calculate how many children have been procreated together in the families where the births have taken place, and thus also the average per family. By doing this we find an average fertility of a limited number of families, namely, those which have children, and where that year the wife has given birth to a child, hence families where the family-forming is still taking place, the childless families not being taken into account. Although the course of the fertility, computed in this way, for families where a child is born, in the consecutive years, is very interesting, it does not give an image of the real fertility. Gini has demonstrated in his study, already quoted, how one is able to calculate the fertility of the married couples in the consecutive years if one knows for a period of, for instance, thirty years the year when the marriage of the parents of the children born in this period took place and the number of children of the marriage by ranging those children according to the year of marriage of the parents. He did so for New South Wales, Australia, Budapest, and Zürich. For Amsterdam no data are available for the moment. But from 1932 onwards the years in which the marriage took place have been computed, and hence in the future it will be possible to calculate also in this way the fertility in our municipality.

In the meantime some other difficulties arise concerning the application of the order of succession of birth, and before continuing we shall have to face them.

In the publication of the results of the computation of the children born in 1927 in Italy, according to the order of succession, Savorgnan[1] demonstrated that this order of succession can be calculated in two different ways, namely, as to "deliveries," so that twins and triplets are counted as one delivery, or as to "children," in which case, for instance, a woman who gives birth to twins, after having had already once one child and once a triplet, is having her third delivery but her fifth or sixth child.

[1] Franco Savorgnan, *La statistica delle nascite legitime secondo l'ordine de generatione*, Roma, 1933.

And, further, that it makes a difference if we calculate the order of succession in regard to the mother, the father, or the marriage (see the statement made above about firstlings).

In his study already mentioned, Gini has enlarged the number of possible methods to determine the fertility, with a great number of other possibilities. We could calculate the number of *deliveries* and the number of *children* as to the *mother*, the *father*, and as to *couples* either; as he calls it, the *productivity*, e.g. the average number of children per matrimony, thus including the childless matrimonies, or the *prolificity*, e.g. the number of those who have had children. We are able to state this *finally* or *actually*, namely, according to the termination of the productivity (after the dissolution of the marriage, or at the end of the procreation period) or at the moment of the birth of the child in question. Further, one can include the former *dead-born* children or only the children born alive; and finally, following this method one can do this *bruto* or *netto*, namely, including *all* the children born alive or those who, on the moment of considering the facts, are *still alive*, in other words, by stating the extent of the family at *that* moment.

Seventy-two different manipulations are thus possible with the same data, and every single one is worth while being considered, as every one responds to a special aim for which one wants to use them. Nowhere, however, are they all possible at the same time, for the data necessary to this manipulation are not all gathered. For Amsterdam, up to the present, only the first-mentioned method has been applied, namely, the place of the child in the family, but (1) a number of children (not very big, however) have been counted as firstlings, being in reality not the first child, namely, those of which either the mother or the father, or both, have had already children in former marriages, and (2) a number of later-born children, who, for the same reason, being counted differently, would have had a higher number. In stating the order of succession all the former born dead and born alive children are included, and twin and triplet births are regarded as two, respectively three, born children. Only for the percentage of twins as to order of succession the twins have been regarded as one *delivery*, of which the order of succession, however, has been stated according to the number of *children* formerly born. This is the same method which Savorgnan has used for the compilation of the children born in 1927 in Italy, and which he

recommends in an article in the *Revue de l'Institut International de Statistique*.[1]

A calculation of the fertility at the moment of decease of one of the partners (third method) was till now not possible for Amsterdam, as only the number of *minor* children left has been noted.

Now the percentages of the first, second, third, and later-born children in Amsterdam, calculated as has been mentioned, compared with those of some foreign towns, may follow.

Town	Period	Born Children in Order of Succession				
		First Child	Second Child	Third and Fourth	Fifth and following	Total (without unknown)
Amsterdam ..	1926–30	33·8	24·9	23·4	17·9	100
Berlin	1926–30	52·3	26·7	15·7	5·3	100
Hamburg ..	1926–30	49·8	26·7	17·7	5·8	100
Cologne	1926–30	40·6	26·0	21·7	11·7	100
Breslau	1926–30	36·3	28·0	23·8	11·9	100
Zürich	1926–31*	51·0	28·6	16·3	4·1	100
Warsaw	1928–32	40·0†	25·4†	22·9†	11·7†	100†
		39·4‡	26·3‡	23·1‡	11·2‡	100‡
Milan	1931–33	45·3	26·8	20·3	7·6	100
Naples	1932–33	22·2	18·3	29·4	30·1	100

* Without 1927. † Christians. ‡ Non-Christians.

Of the towns mentioned here, only Naples records higher birth-rates than Amsterdam. But Amsterdam, nevertheless, shows, in spite of the decrease of the birth-rates, stated several times before, a larger number of fifth and later-born children than any of the other towns.

A consideration of the *prolificity* of the Amsterdam couples may follow now. Whereas the 14,561 married mothers who have been delivered during the year 1900 had had till that year 56,500 children in their actual matrimony, which means an average of 3·88, the 12,726 mothers delivered in 1930 had only had 36,322 children, which means an average of 2·85. This means that there has been born just one child per family less since the beginning of this century. For Italy this average was for the year 1927, 3·45.

As most of the foreign towns which indicate the number of

[1] F. Savorgnan, *La statistica delle nascite secondo l'ordine di generatione*, Revue 1933, pp. 23 ff.

births as to the order of succession do not go further than the fourteenth, the twelfth, or even the sixth child, giving one figure for all the following children, it is not possible to calculate this ratio for those municipalities. Only for Warsaw there are some data: for Christians, 2·42, for non-Christians, 2·03, but probably only the preceding children still alive have been taken into consideration.

In order to get an insight in the number of childless marriages, we ought to compare the average number of marriages with the average number of firstlings during a certain period.

As the number of firstlings born after a matrimonial duration of ten years is very small, decennial periods should be examined. The result then is that, nowadays, these two numbers are in the proportion of 100 : 75, so that the number of childless marriages appears to be about 25 per cent.

As to the *prolificity*, it is also possible to give this at different ages of the mother.[1]

AVERAGE NUMBER OF CHILDREN PROCREATED BY FEMALES WHO GAVE BIRTH TO A CHILD

Age of the Mother	Amsterdam		Canada, 1925*	Warsaw, 1930†	
	1918–21	1929–30		Christians	Non-Christians
–20 years	1·15	1·11	1·28	1·10	1·16
20–24 years	1·59	1·58		1·55	1·35
25–29 years	2·31	2·15	?	2·05	1·87
30–34 years	3·50	3·20	3·12	3·01	2·54
35–39 years	5·05	4·56		4·09	3·58
40–44 years	6·82	6·45	7·37	5·29	4·88
45– years				5·81	6·57

* See *Journal de la Soc. de Stat. de Paris*, 1930, p. 338.
† Probably only including the children still alive.

As might be expected, the number of children rises with the age. For Amsterdam, however, we can state a decline for all the ages in the last period since the former.

Further, we are able to give the prolificity for a combination of the ages of the parents, namely, their age-difference.

[1] In the article by Gini, mentioned on page 6, he gives similar figures for a number of countries and cities, where the number of produced children has not been stated at the moment of the delivery, but at the death of the mother.

Age Difference of the Parents	Average Number of Children per Family, where a Child has been born in	
	1918–21	1929–30
Mother older than father: 15– years	2·06	3·00
Mother older than father: 10–14 years	2·31	1·79
Mother older than father: 5–9 years	2·70	2·49
Mother older than father: 1–4 years	2·97	2·78
Same age	3·13	2·90
Father older than mother: 1–4 years	3·21	2·91
Father older than mother: 5–9 years	3·05	2·84
Father older than mother: 10–14 years	2·95	2·74
Father older than mother: 15–24 years	2·93	2·61
Father older than mother: 25– years	2·44	1·97

We see that the families where the father is one to four years older than the mother are the most fertile, except the slight number of accidental cases where the mother is fifteen years older. The divergencies, however, are not so great.

Finally, we are also able to calculate the fertility in this way as to the *religions*, as has been done in the table below.

The Parents	Average Number of Children procreated per Family where a Child has been born in	
	1921–25	1926–30
Both Protestant	2·91	2·77
Both Roman Catholic	3·50	3·52
Both Jewish	2·67	2·52
Both no religion	3·09	2·71
One Protestant, one Roman Catholic	2·96	2·93
One of the two no religion	—	2·31

The data on the *order of succession* enable us to investigate the succession as to the number (percentage), the sex, and the lapse of time between two deliveries in the same family. However, we have to take into consideration that the order of succession has been given as to the births in the actual matrimony, so that not all the children counted as firstlings are really first children. But the difference is not very big. For 1931 and 1932 both data have been computed. For these years we find that there were: From the *matrimonies*, 35·3; from the

mother, 34·3 per cent first children; 24·9 and 24·9 per cent respectively second children; 13·9 per cent and 14·0 per cent third children, and so on.

As to the numbers of children in the different serial numbers, we have already spoken about the increase of the percentage of firstlings in the succeeding periods. As to the later-born children, this increase of the percentage of firstlings continues for second and third children since the beginning of this century, which demonstrates a decrease of the rates for the later-born children. For fourth children an increase can be stated from 1924–25 to 1926–30, but, apart from that, a constant decrease, just as for all the children later born than the fourth children.

The same phenomenon can be stated for the different age-groups of the parents and for all religions. Nevertheless, we find still large families of Roman Catholic or partly Roman Catholic couples. Among the Jewish families we find in the first period more small and more large families, but the last have declined a lot.

The data for the sex in the different serial numbers enable us to investigate to which degree there exists a tendency for *homogeneity* of sex; in other words, if the sex chances at birth change with the consecutive births in the same family.

In order to find this out, the percentage of the boys has been calculated occurring among the consecutive births.

	Percentage of Boys among the Born Children in		
	1918–20	1921–25	1926–30
First children	51·61	50·15	51·81
Second children	51·39	51·21	51·57
Third children	51·39	51·14	51·78
Fourth children	52·93	50·84	52·09
Fifth children	52·82	50·99	50·54

It appears that there is no question of an increase of the number of boys compared to the number of girls for the consecutive births, as would be the case if there were a tendency to children of the same sex in the same family.

We come to no other result if we trace whether, in families where hitherto only children of the same sex have been born,

this sex continues to manifest itself. The percentages in the following table have been calculated in order to demonstrate this.

Period	Percentage of Boys among Newly Born Children in Families, where hitherto were born in total			
	1 Boy	2 Boys	3 Boys	4 Boys
1918–20	51·84	53·12	55·32	56·15
1921–25	51·10	52·36	49·65	51·00
1926–30	51·98	51·34	51·21	47·57
	1 Girl	2 Girls	3 Girls	4 Girls
1918–20	51·01	50·53	51·33	47·44
1921–25	51·32	49·72	51·28	51·02
1926–30	51·13	52·20	50·72	52·15

For the period 1918–20 we were able to state for the group of families where hitherto only boys had been born an increasing percentage of boys for the following births; but there was no question of a *decreasing* percentage of boys in the other category of families where only girls had been born. Not a single regularity in this direction can be observed in the figures for the later years.

This result, namely, the *non-existence* of a tendency to *homogeneity*, agrees with the research work done by the mathematician J. Spier, for large families, to which the publication by Wolda, already mentioned, referred.[1]

The lapse of time between two births in connection to the month of the year in which the birth takes place offers interesting data on the domain of biology, namely, on the domain of periodicity, rhythm, and symmetry by births. For this question we refer to the results which Wolda found on this matter, and which have been published in the Statistical Communication No. 91 of the Amsterdam Bureau of Statistics (in English). In order to complete the data about this matter, the order of succession, according to the month in which the birth took place, has been

[1] R. A. Fisher applies, in his *Statistical Methods for Research Workers*, fifth edition, 1934, a special method for data, respecting more than 50,000 German families with eight children, drawn from Geissler: "Beiträge zur Frage des Geschlechtsverhältnisses der Geborenen," *Zeitschr. des K. Sachs. Stat. Bur.*, 1889. He comes to the result that there exists a very slight tendency to homogeneity. If one applies his method to the Amsterdam data, one comes to a negative result.

investigated. And once more it is confirmed that, not only for the later-born children, but also for the firstlings, the month February (May conception) plays an important part.

HOUR OF BIRTH

It appears, as was to be seen formerly, that, if we divide the day in eight periods of three hours each, the greatest number (15 per cent) of the children are born in the first period (from 0 to 3 o'clock) and the smallest number (11 per cent) from 15 to 18 o'clock.

In 1930 this has been calculated separately for boys and girls, but these figures are still too small to admit a definite conclusion.

MORTALITY

The Extent

The simplest way in which the increase or the decrease of mortality is usually indicated is just as for the birth-rates, the number of deceased on 1,000 inhabitants (*mortality-rate*). And again, just as for the birth-rates this figure is not very well suitable for the comparison with mortality elsewhere or in former years, as the age-composition of the population is not always and everywhere the same and as the intensity of the mortality-rates differs for different ages. In a country or a municipality or town-district with many old people or many babies, even though these groups present an equal mortality, the general mortality-rates will be higher than in districts where those parts of the population are smaller in number.

In order to meet this difficulty, we usually eliminate the influence of the difference in age-composition by calculating how great the mortality would be if that composition were equal to that of a normal standard population, namely, by applying the method of Körösi or the English method. For this manipulation the Swedish population on December 31, 1881, was originally accepted. Later on also the combined population of Germany, England, France, Italy, and Sweden round about 1920. Schneller[1] demonstrated that there are objections against the last method, and he prefers the present Dutch population.

[1] In *Journal de la Société Hongroise de Statistique*, 1930, pp. 516 ff.

However, some opposition has arisen against the Körösi method[1] itself, because, in applying this method, we remain dependent on the age-composition of the standard population, and because the order of the mortality-rates, ranged as to their extent, will diverge for a different standard population, so that, after all, the Körösi figure does not objectively illustrate the mortality. The method least subject to this consideration is the one whereby for every population the average duration of life of a born child, as derived from the mortality table, is considered as the basis for the calculation of the mortality-rate, so that the mortality-rate of the stationary (table) population may be obtained. This computation, however, is too elaborate to be applied very often, and, as the differences first mentioned are of small importance and as the main purpose will be to compare areas with equal age compcsition, in the following use will be made of the Körösi method. However, the objection against this method is that it can only be applied in the years just before and just after a census, as only in these years the age-composition of the population will be known. And for that reason in the following pages several of such-like years will be combined.

In general, the yearly number of deaths in Amsterdam—be it sometimes with strong fluctuations, especially in the eighteenth century—has been the same during the last two hundred and thirty years, namely, about 7,000, so that it may be safely said that the demand for funerals, with all the inherent factors, has remained more or less the same.

The greatest fluctuations have been registered in the eighteenth century, when epidemics of smallpox, plague, and cholera raised the mortality-rates again and again. Consequently in that century the number of cases of decease has been very seldom below 7,000, rather often over 8,000, and during one decade even more than 10,000. In the first half of the nineteenth century these fluctuations became less and less important; only one year the number surpassed 10,000, and it was often between 6,000 and 7,000; but for a few years it has been above 8,000 or under 6,000; and after 1850, too, we find, in spite of the augmentation of the population, the same figures, although, *inter alia*, the years 1855 (cholera), 1871 (smallpox), and 1884 (scarlet fever and measles) record terrifying figures. Finally, in the twentieth century the number

[1] A. Landry, "Taux rectifiés de mortalité et de natalité," in *Journal de la Société de Statistique de Paris*, 1931, pp. 24 ff.

varied in the beginning between 7,000 and 8,000; later on between 6,000 and 7,000, with a few exceptions. Only one year recorded an excessive mortality-rate, namely, the influenza year 1918. But even then the number of 10,000, which formerly occurred frequently, was not fully reached, the actual number being 9,991.

It follows from these introductory notes that with the constantly increasing population the mortality-*rate* has gradually decreased, again with some fluctuations. The regular decrease did not start before 1880, when the number was still 27·4;[1] in 1889–90 it was 22·2;[1] in 1899–1900 it was 16·2;[1] in 1909–10, 12·5; in 1920–21, 10·2; in 1930–31, 8·7. On the other hand, in the years of epidemic it was, in 1855, 40·4; 1871, 33·4; 1884, 27·7; and in 1918 only 15·6.

If we correct these mortality-rates, applying an equal composition of the population,[2] they become, on the basis of the population in 1930, for 1880, 22·8;[3] 1889–90, 19·6;[1] 1899–1900, 15·7;[3] 1909–10, 12·6; 1920–21, 10·4; and 1930–31, 8·7, which means till the beginning of this century lower than the ordinary mortality-rates mentioned before, certainly due to the fact that a greater infant mortality of former days is less accentuated, on account of the present composition of the population. It should be remarked that in judging the mortality-rates since 1925 the fact has to be taken into consideration that before that year the children born alive, deceased before the notification at the registrars, had been counted with the children notified dead, and not with the number of deceases, but ever since they are considered as cases of decease. (See also the section on Births, Vol. II, No. 4, page 40.) This gives a difference in the mortality-rate of about 0·2.

How are the mortality-rates in Amsterdam compared to those of *other towns* in foreign countries? The only correct way is to calculate the Körösi figures. It has been possible to calculate these figures for several towns and for a number of periods just before and just after a census. This has been done *with the Amsterdam population of* 1930 *taken as standard*. The following results have been found:

1 Mortality within the municipality.
2 According to the groups in the table on p. 31.
3 Mortality within the municipality.

Towns*	Period	Körösi Figures	Period	Körösi Figures	Percentage by which the Number in the last Period has decreased since the first Period
London ..	1911–13	15·0	1930–32	11·0	26·7
Berlin ..	1911–13	16·4	1924–26	12·1	26·2
Paris ..	1911–13	18·2	1925–27	15·2	16·5
Hamburg ..	1911–13	16·2	1924–26	11·8	27·2
Budapest ..	1911–13	23·5	1929–32	18·3	22·1
Milano ..	1911–13	19·9	1930–32	12·4	37·7
Prague ..	1911–13	18·6	1929	13·3	28·5
Amsterdam	1911–13	11·9	1930–31	8·7	26·9
Cologne ..	1911–13	17·9	1924–26	12·6	29·6
Leipsic ..	1911–13	17·2	1924–26	12·6	26·7
Dresden ..	1911–13	16·1	1924–26	11·8	26·7
Copenhagen	1911–13	14·5	1924–26	11·6	20·0
Rotterdam ..	1911–13	12·1	1930–31	8·8	27·3
Breslau ..	1911–13	20·8	1924–26	14·2	31·7
Stockholm ..	1911–13	14·6	1929–32	10·6	27·4
The Hague ..	1911–13	11·8	1930–31	8·6	27·1
Magdeburg ..	1911–13	17·5	1924–26	12·9	26·3
Zürich ..	1911–13	14·9	1929–32	10·3	30·9

* Ranged according to extent.

The Hague, followed by Amsterdam and Rotterdam, records the lowest figures, but, as they have always been rather low, they do not show the greatest improvement.

According to Prosperity Level

Parallel to the birth-rates, the number of deceases has been counted in the different geographic parts of the town in order to investigate whether the prosperity-level influences the mortality-rates. Not many investigations about this matter are known which have been made elsewhere.

In 1920, Hersch[1] compared the mortality of the different districts of Paris during the years 1911–13, for which investigation he determined the prosperity of those town quarters as to the revenues of the house-tax. The result was that the mortality-rates declined from 24·6 in the poorest to 9·6 in the richest quarters.

The difference between the two extremes, from an investigation

[1] M. L. Hersch, "L'inégalité devant la mort," in *Revue d'économique politique*, 1920, pp. 273 ff.

published by Stevenson for London for the same years,[1] appeared to be much more. Here the criterion of prosperity was the number of servants per hundred families. In the four groups of town districts formed after this criterion the mortality-rates per thousand inhabitants—standardized—decreased from 17·4 in the poorest to 12·1 in the second richest group, whereas the richest group recorded the figure 13·4. Thus an aspect totally different from Paris.

If for Amsterdam we range the parts of the town in question (see section on Births, Vol. II, No. 4, page 44) as to the percentage which in the earliest periods the assessments of the income tax above 2,200 guilders formed of the total number of assessments in this tax for the town quarter, namely, from the richest to the poorest, we find:

MORTALITY-RATES

Town Quarter	1908–11	1930–31	Percentage Decrease
VI	14·0	7·9	44
XIII	11·1	5·5	50
III	15·9	12·7	20
VIII	10·7	7·7	28
II	14·2	14·0	1
XII	9·9	8·7	12
V	12·4	10·6	15
IX	9·9	9·3	6
XI	10·7	8·0	25
I	13·6	12·7	6
IV	12·7	17·3	36*
X	8·2	6·7	18

* Increase.

Although undoubtedly a tendency of the mortality to decrease shows itself in these figures parallel with the increase of prosperity, there is no question of any regularity in the decrease. The main cause can be found in the fact that the different quarters rather strongly differ in age-composition. For that reason we have to compare here also the material with the Körösi figures. The material necessary for such-like comparison is only available for the period 1929–32. If we make the same calculation for thirty

[1] T. H. C. Stevenson, "The Incidents of Mortality upon the Rich and Poor Districts of Paris and London," in *Journal of the Royal Statistical Society*, 1921, pp. 90 ff.

quarter-groups, we find here also an irregular decrease of the mortality with increasing prosperity; it appears that the housing conditions have a strong influence on the mortality. In the table following below, fifteen parts of the municipality have been ranged first as to the sequence of the average number of persons per room in every part, to which is added the prosperity grade, and by the side of it the sequence of the percentage of houses with insufficient sleeping accommodation in every part, also adding the prosperity grade, all the figures ranged consecutively from the most unfavourable to the most favourable quarter.

Average Number of Persons per Room Grade	Prosperity Grade	Mortality, per Thousand (Körösi)	Mortality Grade	Percentage of Houses with Insufficient Sleeping Accommodation Grade	Prosperity Grade	Mortality per Thousand (Körösi)	Mortality Grade
1	2	9·10	5	1	2	9·10	5
2	1	8·45	8	2	1	8·45	8
3	5	9·40	4	3	5	9·40	4
4	7	11·21	1	4	8	10·22	2
5	8	10·22	2	5	7	11·21	1
6	3	7·90	13	6	3	7·90	13
7	4	8·62	6	7	11	8·18	12
8	6	8·30	9	8	12	9·81	3
9	10	8·47	7	9	9	8·19	11
10	9	8·19	11	10	6	8·30	9
11	12	9·81	3	11	10	8·47	7
12	11	8·18	12	12	13	8·26	10
13	13	8·26	10	13	4	8·62	6
14	14	7·26	14	14	14	7·26	14
15	15	6·94	15	15	15	6·94	15

If we study these figures carefully, we may not arrive at the same conclusion as Bourdeix, who in 1931 published an investigation about the influence of the habitation density on the mortality in Paris,[1] namely, that it was impossible to state a similar influence, does not hold good for Amsterdam. Nevertheless, we are able to assert here that the lowest mortality accompanies the most favourably situated, but not vice versa. The fact that here, too, some parts deviate from the rest must have a special reason which should be the subject of further investigation.

[1] Pierre Bourdeix, "La densité de la population et la mortalité," in *Journal de la Société de Statistique*, Paris, 1931, pp. 133 ff. and 137, conclusion 6.

According to the Season

It is known from olden times that the mortality-curves show two peaks, namely, the winter peak, caused by the decease of old people in the cold and the inclement period, and the summer peak, as the consequence of the fact that a number of babies did not survive the heat. Lately this has changed somewhat. In Amsterdam the mortality per thousand inhabitants annually in the month of January, which in 1811–19 was still 48·26, has decreased to an average of 11·66 in the years 1921–30 (in 1930 even to 9·39, in 1932 to 8·84), which means to less than a quarter. The July mortality, which in the oldest period happened to be the most favourable one, decreased from 30·59 to 8·12 (in 1930, 7·26), a decrease to a little more than a quarter.

Thus not much has changed in the mutual relation between the months with the highest mortality and the one with the lowest mortality, even though nowadays the highest mortality occurs alternately in January, February, or March, and the lowest mortality in August or September; the last mutation is the consequence of the disappearance of the summer peak for babies.

We are able to observe in more detail the influence of the season on mortality by comparing the weekly mortality-rates with the weather which prevailed during the period. An attempt to come to such a comparison undertaken by the Amsterdam Bureau of Statistics in the years 1906–8[1] has been repeated at present, in which the consecutive weeks of the years 1930 until 1934 have been considered separately. From these figures it may be deduced that the mortality is strongly connected with the course of the temperature. If we calculate the correlation between the weather factors and the mortality, we only find with the temperature a high coefficient, namely, as a matter of course, a negative one; a coefficient of — 0·63 appears to exist between temperature and total mortality in the same week of observation. The correlation between temperature in a certain week and the mortality in later weeks is still greater: with the mortality in the week following the temperature observation the coefficient is — 0·70, with the mortality two weeks later — 0·71, with the mortality three weeks later — 0·70. There are a few diseases which strongly react on the weather. Further, the maximum level of the barometer shows an

[1] See *Statistical Annuary*, 1905–9, Tables CXIV–CXVI.

inclination to a slight *positive* correlation with the total mortality-rate. The course of the two phenomena during the different seasons is practically equal. This explains the high correlation coefficient which we found before. As in the season other elements besides the temperature assert themselves, the question arises whether it is indeed the temperature which has such an important influence as we are inclined to deduce from this coefficient. In order to judge this question, we may study first of all how great the relation will be if we eliminate the season fluctuation from the course of the mortality and the temperature. In doing so we find the correlation coefficient to be — 0·19, so that the *direct* influence of the temperature on the mortality apart from the season does not prove to be great. The figures from which the season influences are excluded estimate the *general* influence too low, and the figures with the season fluctuations estimate this influence too high. Hence there is a well-founded reason to study *all* the season elements in relation with the mortality.

According to Sex and Age. Mortality Table

Absolutely as well as relatively the mortality among the male part of the population is bigger than among the female part, and this has been the case ever since the investigators have begun to observe these questions. As all the females who are born have to die as well as all the males, this phenomenon can only mean that men die *earlier*, at a lower age, than women. During the last seventy-five years the mortality-rates in every period and for all age-groups in Amsterdam have been higher for men than for women, with one exception, namely, the group of persons of 14 to 19 years in the period 1916–25.

During the last forty years, however, the difference has become smaller and smaller, and at present it is only very slight. In 1855–64 it was 3·5 per thousand; afterwards it increased to 3·7 in 1885–94, and in 1930–31 it was not more than 0·2. Undoubtedly the cause of the decrease of the difference can be found, on the one side, in the decrease of professional accidents for men as the consequence of better hygiene and safety in the enterprises which lead to greater mortality of men (sanitary conditions), on the other hand, in the increasing dangers for the health of women, as women nowadays take more and more part in industrial and public life, therefore in a slower decrease of the female mortality.

Bandel[1] assigns the higher mortality of males also to a bigger consumption of alcohol; we shall refer once more to this question on page 42 when treating the causes of decease.

The course of the deviation between men and women in the different age-groups appears from the following table, where has been calculated for each group the mortality-rates for males expressed in percentages of the mortality-rates of females.

Period	−1 Year	1–4 Years	5–14 Years	14–19 Years	20–49 Years	50–64 Years	65–79 Years	80– Years
1855–64	118·1	108·6	103·7	101·8	120·8	137·2	105·0	121·3
1885–94	124·8	104·3	102·4	116·7	138·0	149·1	124·0	107·2
1905–14	125·2	110·1	109·1	100·0	114·3	131·6	119·4	119·8
1930–31	131·7	112·1	109·1	111·1	103·2	119·7	119·8	104·8

The smallest deviation appears to exist in the group 5–13 or 14–19 years, whereas it increases from these groups to lower and higher groups up to the one of 50–64; after that it decreases again. The decrease of the deviations in the consecutive periods is not so pronounced for the age-groups as for the total mortality; there is even a striking increase of the deviation in the case of babies (under one year).

A few years ago Gini[2] devoted special attention to the fact that the mortality for men between 20 and 24 increases rather strongly; he imputes this phenomenon to the altered way of living of the adolescent, who at that moment enters into social life and who, among other things, is more exposed to venereal diseases. He is of opinion that, as a consequence of the latter fact, also the number of still-births out of fathers figuring in this age-group is bigger. Seeing that this phenomenon equally with the estimation of the course of mortality through different age-groups in general can best be established from a mortality table, a similar table has been compiled for Amsterdam. It has been worked out by the mathematician of the Department, Mr. J. Spier, based on the age-composition of the Amsterdam population at the time of the censuses of 1920 and 1930 and of

[1] Bandel, "Zur Frage der Sterblichkeitsunterschiede der beiden Geschlechter und ihrer Ursachen in der Vor- und Nachkriegszeit," im *Allg. Statistisches Archiv*, 1929, pp. 604 ff.

[2] C. Gini, "Der Anstieg der Sterblichkeit beim männlichen Geschlecht im Alter von 20 bis 24 Jahren," in *Stat. Zentralblatt* 1932, kol. 129.

the mortality per year of age during the period of 1921–30 mentioned above, and calculated in the same way as the Central Bureau of Statistics used to do.[1] It has been published in the Statistical Communication, No. 100, table 41, of the Amsterdam Bureau of Statistics. From this table it appears that in Amsterdam, too, the decrease of the mortality after the first year of existence is followed by an increase that begins already in the group 15–19 and continues in the group 20–24; then it is followed by a decrease, after which the increase begins which gradually augments to the oldest ages. The increase beginning after the fifteenth year occurs equally among men as well as among women, but for men it is more accentuated. This fact has been ascribed to the increase of tuberculosis at this age, which illness formerly caused half, and nowadays a third part, of the total mortality in the age-group 15–19 (29 per cent of the boys, 38 per cent of the girls).

By the side of this, the fact stated by Gini is also confirmed, because the difference in mortality per thousand persons between the groups 15–19 and 20–24 was in the years 1930 and 1931 indeed greater for men than for women.

Age Group	Mortality per 1,000	
	Males	Females
15–19 years	2·1	1·9
20–24 years	2·6	1·9
25–29 years	2·1	2·3
30–34 years	2·7	2·4
35–39 years	3·1	3·2

The big increase in the female mortality occurs only after the thirty-fifth year; in this period (from 29–47) the mortality chances for women are greater than for men, especially for married women. Later on this subject will be treated in detail.

The mortality in the different age-groups is not the same either in the different seasons; thus the average daily mortality in the different months of the year is, for persons older than 65, smallest in August, greatest in January or February.

In this respect the situation for babies has completely changed of late. Whereas during the period 1900–9 the greatest daily

[1] *Census*, 31 *Dec.*, 1930, Vol. VI, Mortality Tables for the Netherlands, pp. 5–8.

mortality (5·42) occurred in August and the lowest in November (3·99), in 1926–30 the highest records (1·91 and 1·79) figured in the first months of the year and the lowest (1·21) in August, which proves that the influence of the summer heat has been eliminated and that nowadays it is the affections of the respiratory organs which menace babies most, and this in winter time.

Finally, a few remarks concerning the decrease of the mortality in the different age-groups in which in the 118 years on which data are available different fluctuations have taken place.

Period	Per 100 Deaths in the Age Groups							
	–1 Year	1–4 Years	Together	20–50 Years	50–64 Years	65–74 Years	75– Years	Over 50 Years
1812–19	21·9	13·7	35·6	22·3	14·8	10·6	9·2	34·6
1870–79	28·9	16·8	45·7	17·7	12·5	9·6	8·4	30·5
1921–30	8·5	4·8	13·3	17·9	20·5	20·6	23·0	64·1

Whereas in the beginning of the nineteenth century one-third of the mortality affected babies and small children, one-third persons older than 50 years, and one-third the rest, nowadays only one-eighth falls in the first-mentioned group, two-thirds in the group of persons older than 50, and one-fourth in the rest. Taking another example, we see that in 1860–96, 50·5 per cent of the deceased were younger than 20 and 7·3 per cent older than 74, whereas in 1921–30 these figures were 18 and 23 per cent. While the average annual numbers of cases of decease in 1812–19 and 1921–30 were about the same (7,072 and 6,808), from this number there were 1,546 babies in the first period, in the latter only 550, but in the first period 624 persons were older than 74, in the last 1,346; in the first period there were 973 small children, in the latter 273.

In these figures, which are not especially Amsterdam figures, but which reflect a general phenomenon, a total change in human life demonstrates itself, a considerable decrease of sorrow and misery, which not only must have affected the inner life, but which also must have been of great importance socially and economically, and which must have changed the ideas and opinions of humanity.

However, it would be incorrect to deduce from the increase in the older ages that the mortality in these groups has not

decreased; an opinion about this matter can only be formed after the figures in question, having been connected with the number of persons present in every age-group, which means after calculation of mortality-rates for every group, we see that the mortality has declined in *all* the age-groups, for, during the period 1930–31, in the different groups the mortality-*rate* has decreased since the period 1855–64 as follows:

	Percentage Decreases in Mortality Rates							
	-1 Year	1–4 Years	5–13 Years	14–19 Years	20–49 Years	50–64 Years	65–79 Years	80– Years
Males ..	84·8	92·7	85·7	64·3	78·8	60·3	36·2	42·4
Females ..	86·4	93·0	86·4	67·3	75·2	54·5	44·1	33·3

Studying this table, we come to the conclusion that the improvement is not greatest for babies, but for small children.[1] But this is the case only since the last years; in the period 1916–25 it was at its highest for babies, in 1895–1904 for children from 5 to 13 years.

However, the mutations can be stated much better from the decrease of mortality chances, as well as from the increase of the average duration of life (life expectation).

In the following table the *life expectation* at different ages has been inserted as deduced from the different mortality tables.

	0 Year	5 Years	10 Years	20 Years	40 Years	60 Years	80 Years
				Males			
1830	29·3	43·0	40·7	32·9	21·9	11·6	4·8
1921–30	62·7	62·7	58·2	49·1	31·3	15·3	5·2
				Females			
1830	35·1	47·8	45·0	37·0	24·8	12·8	4·8
1921–30	65·0	64·1	59·5	50·3	32·7	16·6	5·6

It might be worth while to compare Amsterdam as to the decrease of the mortality at different ages with some foreign towns. This has been done in the table on page 35.

[1] Dr. H. Sajet consecrated a medical-statistical study to the number, the morbidity, the mortality, and the lethality of small children, published in the Statistical Communication of the Municipal Bureau of Statistics in Amsterdam, No. 84: *Some Statistical Data about Small Children* (*1929*).

PERCENTAGE BY WHICH THE MORTALITY *HAS DECREASED* SINCE THE PERIOD 1911–13 IN THE PERIOD MENTIONED AFTER EVERY TOWN*

Towns†	Period	Age-Groups												Total Mortality
		–1	1–4	5–9	10–14	15–19	20–29	30–39	40–49	50–59	60–69	70–79	80–	
London	1929–32	45·8	52·6	34·4	30·0	11·5	12·1	37·7	38·3	28·8	19·4	10·7	2·5	26·7
Berlin	1924–26	44·7	59·7	57·8	47·8	25·0	8·5	29·8	31·2	25·1	16·1	7·7	9·3	26·2
Paris	1925–27	18·7	27·2	4·1	6·9	12·2	14·8	28·1	23·9	15·7	10·1	10·1	10·2	16·5
Hamburg ..	1924–26	42·3	59·6	55·3	45·8	25·0	6·4	26·9	30·6	25·5	21·0	12·2	16·3	27·2
Budapest	1929–30	+1·3	38·4	31·9	21·1	23·4	14·5	46·5	36·9	27·2	18·9	11·8	10·5	22·1
Milano	1930–32	40·9	55·4	48·9	57·5	58·2	53·5	48·8	44·3	33·2	27·4	26·0	21·3	37·7
Prague	1929	56·4	56·1	21·3	44·0	47·1	41·5	37·0	23·8	19·6	16·2	61·1	+13·8	28·5
Amsterdam ..	1930–31	53·7	66·9	52·0	55·0	31·0	40·0	38·6	39·5	23·7	17·3	4·0	3·2	26·9
Cologne	1924–26	46·2	52·5	24·1	21·0	22·2	13·0	28·6	31·4	35·5	24·2	13·9	17·5	29·6
Leipsic	1924–26	36·2	38·3	26·9	26·3	22·6	17·0	22·6	28·8	29·6	27·7	17·2	14·7	26·7
Dresden	1924–26	37·1	52·2	23·4	42·1	6·5	10·6	30·2	34·9	33·5	25·2	17·9	6·5	26·7
Copenhagen ..	1924–26	30·4	41·8	45·2	19·2		35·1		24·7		6·3		4·4	20·0
Rotterdam ..	1930–31	52·0	57·4	26·1	42·9	54·8	29·4	39·6	39·0	29·7	10·8	11·4	5·4	27·3
Breslau	1924–26	39·7	46·1	35·1	46·4	46·0	28·8	40·2	41·8	33·9	24·7	17·2	17·4	31·7
Stockholm ..	1929–32	49·2	63·4	50·0	40·0	33·3	33·9	48·8	37·8	26·2	7·2	5·4	+2·9	27·4
The Hague ..	1930–31	53·5	58·3	56·0	42·9	51·6	38·2	38·3	34·7	12·9	18·0	10·6	10·5	27·1
Magdeburg ..	1924–26	41·2	53·6	58·7	36·0	15·4	+4·2	10·5	20·8	26·2	24·8	15·2		26·3
Zürich	1929–32	56·8	50·0	41·7	31·3	28·6	25·0	36·2	39·0	21·2	25·4	18·0	22·3	30·9

* Percentual decrease of the Körösi figures on the basis of the population of Amsterdam in 1930, for both periods.

† In the order of the number of inhabitants.

In comparing these figures we have to take into consideration the different periods. When compared with the municipalities for which the calculation has been made for the same period, the Amsterdam figures make a favourable impression. Only Zürich records a greater improvement as to the infant mortality. We are struck by the increased infant mortality in Budapest, some unfavourable figures for Paris, and the unfavourable records which in some other towns are found for young people.

According to Civil Condition

It is not possible to state the influence of the civil condition on the mortality without taking into account the age; for only among the non-married the youngest ages figure, whereas among widowers and widows the older people are preponderant. If we compare equal ages, for instance, *from* 20–50 *years*, we find an annual mortality per thousand present:

Periods	Males				Females			
	Bachelors	Married	Widowers	Divorced	Spinsters	Married	Widows	Divorced
1908–11	5·8	5·4	9·8	10·8	4·3	5·4	8·2	7·2
1919–22	5·0	4·2	8·8	7·4	4·0	4·7	7·6	5·7
1930–31	3·4	3·0	4·8	5·1	2·5	3·2	5·3	4·2

A striking deviation between men and women can be stated in these figures. For men in the age-group already mentioned the mortality for unmarried is bigger than for married, undoubtedly as the consequence partly of the fact that the weakest among them remain unmarried and partly of the less care which is taken of the man who lives alone. For women the opposite is the case, in spite of the circumstance mentioned first, which also holds good for females; the mortality of the married females (in any case up to the age of 45) is greater, which fact might be due to the illnesses of pregnancy and child-bed.

We are further struck by the fact that the mortality among persons in widowhood and among divorced persons in this age-group is higher than for the married and the unmarried, whereby the widowers recorded formerly a bigger, nowadays a smaller, mortality than the widows, and the divorced men always showed a bigger mortality than the divorced women.

As to the ages above 50 years, we may conclude that especially in this age-group the bachelors and the divorced men turn out to be in a worse condition. In this group, too, the mortality is at its lowest for married persons; next follow the widowers, then the unmarried; the divorced record the highest mortality, with a few exceptions for some age-groups. For elderly spinsters the mortality is much smaller than for bachelors, and at the ages of 65 and over (most strikingly in the years 1930–31) the mortality among the married females happens to be bigger than for spinsters. Here, too, the divorced are on the top, anyway in the greater part of the five-yearly age-groups.

In other municipalities and countries there exist only a few statistics concerning this matter from which it could be concluded whether a general phenomenon is concerned here. Only a few figures from the State of New York (except the town of the same name) and from Scotland[1] were available; from these figures conditions similar to the ones mentioned for Amsterdam appeared to exist.

According to Religion

Comparing the different relations in respect to the number of cases of decease per thousand persons present, two circumstances have to be taken into account, namely:

(1) The fact that often persons who, at the moment of the census, declare themselves as belonging to no clerical denomination, whereas at the registration of their decease a religion has been mentioned, through which fact the number of cases of decease for the group "without any religion" is absolutely and relatively lower, and the number for the other groups will be higher than in reality will be the case.
(2) The different age-distribution for the different clerical denominations.

If we reduce those clerical denominations to an equal age-distribution like that of the whole municipality at the moment of the censuses of 1920 and 1930 respectively, the annual mortality per thousand persons will be as follows:

[1] George Bliss, "The Influence of Marriage on the Death-rate of Men and Women," in *Journal of the American Statist. Assoc.*, 1914–15, pp. 54 ff.

Religion	1916–25		1930–31	
	Males	Females	Males	Females
Protestant	15·76	13·67	11·92	10·34
Roman Catholic	14·24	13·56	10·46	9·75
Jews	10·89	10·34	8·93	9·67
"No religion"	3·66	3·37	3·94	3·87

Even in these figures there is still too great a difference between the different religions, namely, the small number for persons not belonging to any religion strikes us. This can only be imputed to the fact that the statement of the religion at the census does not agree with the one at the moment of the decease. This difference can be somewhat eliminated by combining the mortality among Protestants and the persons "without any religion," and by comparing this combined mortality with the other two clerical denominations. The table mentioned above then gets the following aspect.

	1916–25		1930–31	
	Males	Females	Males	Females
Protestant and "No religion"	11·02	10·66	8·43	8·15
Roman Catholics ..	14·24	13·56	10·46	9·75
Jews	10·89	10·34	8·93	9·67

Arranged in this way, the Roman Catholics would have the greatest mortality (which can also be the consequence of the fact that there exist also fluctuations between them and the persons not belonging to any clerical denomination). In 1916–25 the Jews, in 1930–31 the Protestants with the group "no religion" together would record the lowest mortality.

Causes of Decease

Due to the frequent changes in the order of causes of decease, it is not easy to give an image of the cycle of the different causes in one continuous series. The detailed history of the classification

of the causes of decease are to be found in a study by Dr. M. G. Neurdenburg.[1] We only want to mention here that in Holland, from 1866–75, a list of fifty-five causes of decease divided in eleven groups was used,[2] and from 1875–1900 a list of thirty-five causes.[3] In 1901 the international list of Bertillon, revised in 1911, 1922, 1925, and 1931, has been introduced.

In 1927, in the Netherlands, an alteration of the notification of decease has been introduced which influences the statistics, namely, the guarantee of secrecy of the cause of decease, as the doctor at present sends his statement in a closed envelope which may only be opened by a medical officer on behalf of the statistics. In the statistics from 1927 onwards an increase of the numbers of cases of decease as the result of illnesses which preferably were kept secret, as syphilis and suicide, is clearly to be seen as consequence of this measure.

The difference between the Netherland lists from the years before 1901 and the international lists commenced in that year is so great that only for some illnesses the course during that whole period may be known. For that reason a division between the period before and after 1901 has to be made.

For the years 1901–31 an effort has been made to obtain a continuous series for the small list as well as for the big one; especially for the latter the fact that here and there illnesses received a special number or were grouped under a different heading after a revision, and equally the change of diagnosis of the same illness formed a difficulty. A well-known example is the fact that many cases, formerly called "infirmity of old age," are nowadays notified as "cancer" or "organic heart disease." Whereas on the one hand, in Amsterdam, during the last quarter of the century (1905–14 to 1930–31) the number of cases of cancer for persons older than 65 years has increased from 291 annually to 538, in other words, by 247, and the number of organic heart disease from 348 to 675, in other words, by 327, on the other hand the number of cases of infirmity of old age has decreased from 437 to 292, in other words, by 142.

In spite of all this, for a number of cases of decease a lot can be deduced from the proceedings of the absolute figures, as the

[1] *Doodsoorzaak en statistiek*, 1929. See also Dr. J. H. van Zanten, *Leerboek der statistische methode*, 1931, pp. 129 and 130.

[2] See Neurdenburg, *ex. cit.*, Appendix III, p. 329.

[3] Ibid., Appendix VI, p. 331.

total number of cases of decease annually did not change notably in the course of the years, as has been stated before.

It appears that lung tuberculosis, cancer, organic heart diseases, and affections of the respiratory organs still occupy the biggest place in the mortality-rates, namely:

Causes of Deaths	Percentage of Total Mortality			Per 10,000 Inhabitants Annually		
	1901–5	1911–15	1926–30	1901–5	1911–15	1926–30
Lung tuberculosis ..	9·8	10·9	6·9	14·3	12·4	6·2
Cancer	7·0	10·3	14·6	10·2	11·7	13·2
Organic heart diseases	4·6	10·1	15·2	6·7	11·6	13·7
Affections of the respiratory organs ..	8·7	13·6	9·9	12·7	15·5	9·0

The contrast between the declining mortality from tuberculosis, on the one hand, and the augmenting mortality from cancer and heart diseases, on the other hand, strikes us.

As to the affections other than those of the four mentioned groups, a distinct decrease shows itself for contagious diseases (107·3 per 10,000 inhabitants in 1901–5 to 42·2 in 1926–30 for all the contagious illnesses together), the other forms of tuberculosis, gastro-enteritis among children under 2 years (from 99·3 to 5·2!), convulsions in the case of congenital bodily debility, and the already mentioned infirmity of old age. An increase is found, on the contrary, except for the illnesses already mentioned, for appendicitis, the illnesses of pregnancy and child-bed (puerpural fever from 0·9 to 2·5), the diseases of female sexual organs, and the affections of the prostate. In general, also from these changes the increasing age of the population may be deduced.

A special place is taken by *influenza*. The course of the mortality from influenza is rather irregular: in the years 1901 and 1912, for instance, 15 and 16 cases of decease respectively; in 1907, 61; 1911, 55; in the first decade of this century the number did not exceed 61 cases annually, and in the following five years it remained small. During the war it increased slightly, but in 1918 it mounted to the number of 1,240 cases of decease, which means 12 per cent of the general mortality, a rate never reached before; in 1920 it declined to 330; in 1921 it was but small (26); in 1922, again 270, and in 1929 even 297, after having been rather low during the intermediate years.

From the course of the contagious diseases (measles, scarlet fever, whooping-cough, and formerly also typhoid fever and diphtheria, which have considerably decreased in number), a similar irregularity as for influenza can be stated.

Smallpox, cholera, dysentery, practically do not occur in Amsterdam; in the years after the war, however, record cases of cerebrospinal meningitis have been stated.

Finally, we have to take into consideration the growing *decease caused by violence*, except suicide, which last question will be treated separately. Formerly death from drowning occupied the most important place in our town abounding in water, especially in the period 1910–15 the number of those cases was great, namely, about 80 annually. During the last years this number has declined to 44. The number of street accidents, on the contrary, increases constantly. This cause of decease nowadays draws especially our attention. Till 1930 these cases were not mentioned separately in the statistics, but, nevertheless, they have augmented the number of injuries by "fall" and "crushing" (*écrasement* in the international list) from 80 in 1910 to 135 in 1930. In 1934, 66 cases of decease (1 per cent of the total mortality) have been notified as street accidents.

For tuberculosis and cancer we are able to compare the mortality-rates per 100,000 inhabitants of Amsterdam with those of foreign towns.

As to *lung tuberculosis*, in the period 1926–30 Melbourne recorded the lowest rate, followed by Amsterdam; the highest rates were found in Montevideo, 289·2; Budapest, 234·0; Warsaw, 188·3; Lyons, 159·7 (Melbourne recording 60·3). In the beginning of this century Melbourne, Copenhagen, and Sheffield were lower than Amsterdam; the highest was Prague with 458·2. In 1926–1930 this town had 139·1. Nearly all the towns have decreased greatly since the beginning of this century.

As to *cancer*, in the beginning of this century Amsterdam occupied the twelfth place out of nineteen towns (with available rates) with 100·6 per 100,000 inhabitants; at that moment Montreal was the lowest with 61·3 and Lyons the highest with 160·8. In 1926–30 Amsterdam occupied the thirteenth place out of twenty-one towns with 132·3 (Munich the highest with 191·6, Naples the lowest with 40·5). In all the towns the number has increased, in some towns rather strongly; only in Naples, Prague, and Lyons a decline can be stated.

Some figures about the mortality from different groups of illnesses belonging to the small list according to *sex and age* follow.

As to the *sex*, we see that for the greatest part of the causes the male mortality is bigger than the female mortality. However, for some causes of decease the opposite is the case, such as whooping-cough, influenza, organic heart diseases, hernia, nephritis. Some of those divergencies, however, are under the influence of the difference in age-composition of the male and the female part of the population. For that reason it will be better to study the separate age-groups and then the bigger mortality of females appears to occur:

For whooping-cough ..	Under 4 years.
For influenza	At all ages, with a few exceptions.
For lung tuberculosis ..	Especially between 5 and 19 years, but sometimes also at other ages, especially in 1916–25 (the war and post-war period, which caused many victims among women).
For cancer	30–50 years.
For organic heart diseases	15–30 years and sometimes at an older age.
For hernia..	Above 40 years.

As for different causes the mortality among girls of 5–19 years is greater than the mortality for boys, we are entitled to conclude that the first-mentioned group has a greater mortality chance than the latter one.

Several foreign authors ascribe the cause of the greater mortality of males especially to the use of alcohol,[1] and they point to the important greater mortality among men from alcoholism, liver-cirrhose, pneumonia, nephritis, apoplexy, and even suicide and accidents. The Amsterdam statistics do not allow a conclusion of the sort. The cases of decease from alcoholism and liver-cirrhose are so small in number that they are not of any importance. For pneumonia, indeed, the mortality is greater for middle-aged men; for nephritis and apoplexy this does not hold good at all, at least for the last years (in 1905–15 nephritis occurred more frequently among men). Neither can the greater number of accidents and

[1] See Bandel *l.c.* Boldrini ("Effetti demografici ed eugenici del vino," in *Contributi del laboratorio di statistica della università cattolica del sacro cuore*, Serie prima, Vol. III, 1928, pp. 5 ff.) has compared two districts in Italy with a large and a small alcohol consumption, and he comes to the conclusion that the influence of wine consumption on the mortality only manifests itself for the older ages.

suicides be imputed to such an extent to the abuse of alcohol, so that from that fact the greater mortality among males could be deduced.

In general, the different illnesses which lead to death are differently divided over the age-groups. So the infectious illnesses are almost entirely restricted to the younger ages (even by typhoid fever the greatest mortality falls between 20 and 29 years), except for influenza, which illness in 1918 and the following years has caused the death of many middle-aged people; before that period and afterwards it had a fatal issue, especially for older persons. The greatest mortality from lung tuberculosis occurs in the groups 20–29 and 50–79. It is a well-known fact that cancer, organic heart diseases, pneumonia, and other affections of the respiratory organs, hernia, nephritis increase with age, and even decease caused by violence occurs much more frequently among older people than among young people.

For this study every group of causes has been contemplated separately, and it has been compared with the number of people present in the different age-groups. The situation gets another aspect if the causes of decease are considered in mutual relation and if we investigate which percentage every group of causes represents of the total mortality in a certain age-group. It then appears, for instance, that the relatively great mortality from lung tuberculosis for persons of 20–29 years really occupies an important place in this age-group, as only few persons in this group die from other illnesses; but in the group 50–79 they occupy a very small place because so many people die from other illnesses. Thus for babies the congenital defects are preponderant; for small children the infectious diseases. Tuberculosis begins especially among small children, and it preponderates in the groups 15–19 and 20–29 with 43 and 39 per cent respectively of the total mortality in those groups. Cancer occupies especially in the age-group over 30 years an important place (for the group 40–49, 25·8 per cent; 50–59, 28·3 per cent; 60–79, 22·1 per cent of the total mortality). For the age-groups above 60 years the diseases of heart and vessels occupy the greatest place (60–79 years, 26·5 per cent; 80 years and older, 28·5 per cent); and so decease by violence occupies in the age-group 5–29 the second place after tuberculosis.

As to the *months* of the year which are most dangerous for the different illnesses, in winter time people die especially from

whooping-cough (generally till April), influenza, lung tuberculosis (March and April), bronchitis and pneumonia, infirmity of old age; on the other hand, the summer months record the highest mortality from infant diarrhoea and death by violence. Cancer is extended over the whole year.

For some illnesses the correlation with the weather has been calculated. In doing so it appears that the course of the mortality from *heart diseases* shows the same character as the total mortality, though in a less important degree. The correlation coefficient between the maximum temperature in every week and the mortality-rate for those illnesses is — 0·47, which means that this mortality increases with decline of temperature and decreases with augmenting temperature. However, if we compare the weekly mortality-rates with the maximum temperature in one and the same week, it appears that, once above 23–24° C., the mortality increases also, so that the heat proves to have a bad influence; if the hot weeks are not involved in the calculation of the correlation, for the rest of the weeks the coefficient would become more negative than the already-mentioned figure of — 0·47.

For the mortality from *pneumonia* a correlation coefficient of — 0·53 was found for the same week; for one week later, —0·61; for two weeks later, — 0·64; for three weeks later, — 0·65. From this we may conclude a strong influence of low temperature.

As to the mortality from *lung tuberculosis*, on the other hand, no correlation with the weather could be stated.

The extent of the mortality from the different causes of decease according to the different *religions* is much influenced by the fact that here the age-composition diverges notably.

The real differences between the religions can only be stated by making the figures independent of the age-composition. Therefore, for a number of causes of decease the mortality during the period 1929–32 has been computed, presuming that the age-composition for every religion is equal to the age-composition of the total population in 1930. This gives the result shown on page 45.

As here also the great difference between the group "no religion" and the others shows itself, we have combined this group with the Protestants, according to the reasons mentioned before. By doing so, for a number of causes the Roman Catholic group becomes the biggest; for a number of other causes the Jewish group becomes the most important. The last group records high rates especially for heart diseases, apoplexy, and diabetes.

	Protestant	Roman Catholic	Jewish	No Religion	Protestant and no Religion	Total Population
Per 100,000 *persons of every age*—						
Infectious diseases	32	31	28	16	23	26
Influenza	30	29	16	13	25	24
Syphilis	9	10	6	4	8	8
Organic heart diseases	151	146	194	59	131	140
Pneumonia	56	50	45	25	47	48
Per 100,000 *persons above* 39 *years*—						
Apoplexy	180	192	212	75	161	173
Diseases of the arteries	65	78	81	29	58	66
Chronic bronchitis	38	39	19	19	35	34
Nephritis	148	160	169	58	128	139
Diabetes	84	87	118	28	71	80
Per 100,000 *persons above* 59 *years*—						
Infirmity of old age	458	506	395	121	405	425
Per 100,000 *children* 0–9 *years*—						
Convulsions	26	22	10	13	18	18

APPENDIX

STATISTICS RELATING TO SUICIDE

It may be said with certainty that the *number of cases* of suicide which figure in the statistics of causes of decease is too low, namely, for two reasons:

In the first place, there will undoubtedly figure among the cases of death by violence—and in our country, abounding with water, especially among the cases of drowning—a number of suicides of which it is difficult to make out whether they really belong to that category. And, further, it might be important for the members of the family to keep silent about the matter, even if it is known to be a case of suicide; this is especially the case if to suicide is attached an odium such as the Roman Catholic Church can pronounce. On the one hand, this deterrent exercises certainly a preventive influence, which explains the low suicide-rates among Roman Catholics, in so far as they still exist (see the following), but, on the other hand, if it has not been able to prevent the suicide, it will encourage silence, and hence it will lower the suicide rates. On the other hand, the guaranteed secrecy of notification, which will be mentioned in the following, will, in its turn, increase those rates.

The judicial investigation instituted after every case of suicide still brings to light a number of cases which have not been mentioned at the notification of the decease, so that the *Criminal Statistics* recorded for Amsterdam, in the period 1926–30, 41 more cases than the mortality statistics, which mentioned only 372 cases.

The exact number of suicides in the statistics has been even more increased by the regulation about the notification of decease which came into operation in the year 1927, whereby medical secrecy is protected by strong guarantees. A noticeable increase of the yearly number of cases is seen since that date. Before 1927 it had surpassed the figure 50 only twice, namely, in 1923 and 1926; in 1927 it suddenly mounted to 70; in the years to 1931 it was 65, 56, and 77 respectively; and in the years after that date, 67, 84, 78, and 82. And still these figures will probably be too low.

A correct insight into the *whole* phenomenon can only be obtained if the cases of attempt of suicide in which death did

not ensue could also be implicated in the statistics. In Vienna and in Budapest, where suicide has a much bigger extent than in the Netherlands (see the following), and where there exists an excellent rescue organization, every case of assistance lent is noted. For Vienna there have been extracted from these notes elaborate statistics,[1] from which it appears that the number of failed cases is much bigger than the number of successful cases; during the period 1926–30, for instance, 9,966 attempts of suicide have been noted against 4,926 cases with a fatal issue.

For Amsterdam *the statistics of admission in hospital* of the municipal medical service[2] may give an insight into the number of attempts of suicide in Amsterdam by the number of those for whom admission in hospital (but only in a "municipal" hospital or a hospital where the municipality can have its patients admitted) has been demanded on account of "attempt of suicide." For 1932 they record 179 cases; for 1933, 154; for 1934, 183, out of which 10, 11, and 7 respectively died afterwards. Those are the only "attempts" which have come to our knowledge, but their number only confirms the Vienna experience of twice as many attempts without issue as the number of cases of decease.

If we limit ourselves to the *cases of decease*, then we may say that the number of those is not high for Amsterdam, and it is doubtful whether it increases apart from the consequence of the measures taken against secrecy mentioned before. Only the following figures (annual averages) may be given:

Periods	Annual Number	Per 100,000 Inhabitants	Periods	Annual Number	Per 100,000 Inhabitants
1875–79	12	3·0	1916–20	45	7·3
1880–89	9	2·5	1921–25	45	6·5
1890–99	26	5·7	1926–30	64	8·7
1900–9	40	8·0	1931–34	78	10·2
1911–15	39	6·5			

We also have to take into consideration that the population grows older and that the number of suicides increases with the age (see the following). If, in 1899, the age-composition of the

[1] See Dr. S. Peller, "Zur Statistik der Selbstmordhandlung," in *Allg. Statist. Archiv.*, 22. Band (1932), pp. 343 ff.

[2] Communications Nos. 31, 33, and 36 of the Medical Department of Statistics.

population had been equal to the age-composition of 1930, in the years 1895–1904 the number per 100,000 inhabitants would have been 7·8, against 12·3 in the years 1929–32. It is noticeable that, during the war, in Amsterdam, as well as in the whole country, the number of suicides rather increased, contrary to other countries, even to Switzerland, where a strong decrease of the number of suicides took place.

The figures just mentioned refer to the cases of suicide of Amsterdam people, wherever committed. About 10 per cent committed suicide outside the municipality. It has sometimes been supposed that the big cities attract or promote suicide; this supposition is not proved by the number of foreigners who carried out their intentions in Amsterdam, and which is not bigger than the number of Amsterdam people who did so elsewhere.

There is also a greater number of suicides in smaller municipalities than Amsterdam. Amsterdam records by no means the greatest number in Holland. Even formerly the big town did not record the highest rates; nowadays this is no longer the case, as is evident from the following table:

	Suicides per 100,000 Inhabitants Annually	
	1911–20	1931–33
Municipalities with more than 100,000 inhabitants	6·7	8·9
Municipalities with 50–100,000 inhabitants..	5·8	7·5
Municipalities with 20–50,000 inhabitants ..	5·1	8·7
Municipalities with 5–20,000 inhabitants ..	6·6	8·5
Municipalities with –5,000 inhabitants ..	7·1	8·3
The whole country	6·5	8·5

A remarkable change in the order of the groups has thus shown itself during the last twenty years. The situation in our country forms a contrast with Switzerland,[1] where the towns of middle size record the highest rates and the big towns the lowest.

These figures are for Holland very low indeed. In comparison with twenty-one foreign towns of about the same size, Amsterdam does not only occupy about the lowest place since 1911 (only Montreal and Sheffield were lower), but the difference between

[1] See Dr. E. Waldstein, *Der Selbstmord in der Schweiz*, 1934.

the lowest and the highest rate is also very big. As opposed to Montreal with 6·5 per 100,000 inhabitants, there are Budapest with 52·5 and Hamburg with 43·9. In the study by Waldstein, already mentioned, we find for Switzerland 23, for the cantons Zürich 27, Glarus 28, Vaud 36, Geneva 31.

Influence of Prosperity

The number of cases in the different town parts, calculated on the basis of one and the same age-composition, gives the answer to the question whether the *prosperity* influences the suicide-rates. This manipulation has been applied for the period 1929–32, and the age-composition of the whole municipality in 1930 has served as standard population. If we range those town parts in the order from the lowest to the highest prosperity-level the following result can be stated.

Town Quarters	Suicides per 100,000 Inhabitants (Körösi Figures)	Town Quarters	Suicides per 100,000 Inhabitants (Körösi Figures)
VI	7·82	XIa	14·97
III	9·38	XV	13·98
VIII	4·92	IX	10·57
XIII	6·55	IV	20·07
II	8·02	XIV	10·21
XII	10·63	XIb	16·56
V	8·76	X	25·98
I	25·30		

In comparing these figures we have to take into consideration that the absolute numbers in every part of the town are small. Nevertheless, it is obvious that the smallest mortality occurs in the least prosperous part and the greatest mortality in the most prosperous part, and that the difference between the minimum (4·92) and the maximum (25·98) is very big indeed. Deviating from this is part I, with almost the highest figure, and the parts XIV and IX, with rather low figures. This may be on account of the religion, which might cross the influence of the prosperity level.

Season

As far as the influence of the season is concerned, it appears that lately the biggest number of suicides seems to happen in April. This also holds good for the whole country, in contrast

with the period 1911–20, and with some other countries where the highest records were noted in summer time. This may be attributed to the fact that the awakening of nature rather depresses the melancholic in opposition to the other parts of mankind.

Sex

An important phenomenon which appears in cases of suicide is the great difference in the way in which both sexes behave in respect to this matter. Round about 1870 the number of suicides committed by women was only one-seventh, round about 1880 it was only one-sixth, of the total number; and after that period it has increased gradually, as can be seen in the following table.

Period	Of 100 Suicides there were		Of 100,000 Older than 14 Years		The Number in Percentage of the Figure in 1890–99	
	Males	Females	Males	Females	Males	Females
1890–99	81	19	14·7	3·0	100	100
1900–04	80	20	14·8	3·2	114	120
1905–09	80	20	22·2	4·8	199	200
1911–15	69	31	14·3	5·6	129	240
1916–20	70	30	13·7	5·3	148	260
1921–25	74	26	14·0	4·5	162	240
1926–30	64	36	15·1	7·7	199	460
1931–33	67	33	18·3	8·7	248	500

The cause of the increase of the percentage of women is probably associated with the more intensive participation of women in economic and social life. In foreign countries the same phenomenon is true; the part of women expressed in percentages of the total number of suicides was:

	Period	Percentage		Period	Percentage
Bern ..	1911–15	26	Frankfort ..	1901–10	22
	1921–25	26		1921–30	33
Hamburg ..	1905–06	23	Paris ..	1920–22	31
	1910–14	24		1923–25	30
	1924–26	29	Prague ..	1910–14	31
	1931	32		1925–29	34
Cologne ..	1891–95	14	Bucarest ..	1910–14	25
	1911–14	22·5		1926–30	31
Magdeburg	1929–29	37			

We see that the differences from Amsterdam are but slight.

Age

As far as the age is concerned, we can say in general that suicide increases relatively (which means per 100,000 persons present in every age-group) up to the age of 65. After that age it decreases, although also among old people the number of cases is very important. However, there are ages, especially in middle age, which indicate a lower suicide-rate than the preceding number in the list, and, further, there is a rather large deviation between men and women; for women, indeed, the number in the younger ages is relatively bigger than for men, and it increases less quickly towards the older ages. So the number of Amsterdam people per 100,000 annually in every group was:

Age	Males			Females		
	1905–14	1916–25	1929–32	1905–14	1916–25	1929–32
15–19 years ..	5·6	3·3	1·3	1·8	0·5	1·9
20–29 years ..	9·5	8·0	7·4	2·8	5·1	6·6
30–39 years ..	14·0	11·8	10·6	6·4	3·8	7·3
40–49 years ..	27·0	12·3	21·0	6·5	6·5	11·0
50–64 years ..	38·9	30·2	33·5	7·0	7·0	15·8
65–79 years ..	33·3	34·8	40·7	6·8	7·5	7·7
80– years ..	16·2	25·7	61·5	—	3·4	14·9

It appears clearly from these figures that the number of suicides committed by school children—which number in foreign countries is here and there alarming—is small in the Netherlands, and that it decreases strongly in the consecutive decades. The periods 1890–99 and 1900–09 record 17 and 15 suicides respectively committed by boys under 20 years (which means not even two cases a year), and of every group there was only one case under 14 years; in 1921–30 there were only 6 in total, and not a single case under 14 years. There were in the first-mentioned period in total 2 and 5 respectively girls younger than 20 years (of which number 1 and 0 under 14 years); in the period 1921–30 4 cases were recorded with none under 14 years.

On the other hand, suicide above 80 years appears to increase strongly. Are the oldest members of our population not proof against modern life with wireless and aeroplanes?

*

Civil Condition

It is also important to investigate the civil condition, but for this study the age has also to be taken into consideration. The 443 suicides during the period 1916–25 give, per 100,000 persons present in every group, the following result:

Age	Males			Females		
	Bachelors	Married	Widowers	Spinsters	Married	Widows
20–29 years ..	8·9	3·6	—	4·7	5·4	—
30–39 years ..	30·0	8·2	18·0	9·3	1·6	9·4
40–49 years ..	22·9	16·3	55·2	16·3	3·0	26·8
50–59 years ..	60·3	24·7	58·4	9·2	5·3	10·6
60–69 years ..	37·9	23·3	35·8	—	8·0	7·4
70– years ..	123·0	21·9	41·9	12·0	9·4	5·0

Studying this table, we come to the conclusion that, on the one hand, for all the different ages, marriage strongly prevents suicide, and, on the other hand, it seems to promote suicide especially in the ages between 40 and 60 years for men and 40 to 50 years for women after the death of one of the spouses. The fact of not being married seems an unfavourable factor. The data concerning the divorced are still too small to allow of any conclusions. A few foreign figures already available lead to the same conclusions. In Switzerland, for instance, especially the unmarried and the widowers and widows without children seem to come to suicide.[1]

Religion

As far as religion is concerned, we already stated that the number of suicides among Roman Catholics is smaller than among the other clerical sects. In order to be able to come to an exact comparison of the different religions, the same fact already noted for other causes of decease also holds good here, namely, that the different age-composition of the population belonging to the different clerical sects ought to be eliminated (for Roman Catholics, for instance, the number of children is relatively bigger). If we calculate the figures as if every group had the same age-composition as the whole municipality in the year 1930, which was only possible for the period January 1,

[1] See Waldstein, *ex. cit.*, pp. 156 ff.

1929, to July 1, 1932, and if, for reasons already mentioned before, we put together the Protestants and the people belonging to no clerical sect, we find for this period the following Körösi figures per 100,000:

	Males	Females
Protestants and "No religion"	11	7
Roman Catholics	11	4
Jewish	13	7

For equal age-composition the deviations between the various religions are slight. It is noticeable that, if we manipulate the figures carefully, we find that only among Roman Catholic women suicide occurs less often, and that for Jewish men the number of suicides is higher than for the others.

These deviations show themselves more clearly if the figures per 100,000 in every group are compared for the different age-groups, as has been done in the following lines for the years 1916–25:

Age	Protestant	Roman Catholic	Jewish	"No Religion"
		Males		
20–29 years	9·3	6·5	5·0	4·0
30–39 years	17·5	8·0	8·0	9·0
40–49 years	12·6	10·2	21·2	7·9
50–59 years	34·1	23·6	30·0	22·9
60–69 years	25·5	30·3	5·5	54·7
		Females		
20–29 years	6·1	1·8	8·0	3·1
30–39 years	5·0	0·9	8·3	2·0
40–49 years	8·3	5·4	6·3	1·6
50–59 years	6·9	7·0	8·2	5·6
60–69 years	6·1	6·7	4·5	13·5

There exists a distinct difference between men and women. Among young men the Protestants are at the top; among young women the Jews. Among men between 40 and 49, the Jews; among women of that age the Protestants. For the age 50–59 the reverse is again the case; and for the oldest group, men as well as women without any religion record the highest rates. Here, too, it is remarkable that among Roman Catholics the

figures for older persons no longer fall behind those for the other religions.

The share of women in suicide in general is indeed not the same for the different religions, as is evident from the following figures:

FEMALE PERCENTAGE OF 100 PERSONS WHO COMMITTED SUICIDE

Period	Protestant	Roman Catholic	Jewish	"No Religion"
1905–14	21·7	15·9	37·3	24·1
1916–25	29·2	26·0	38·8	17·2
1929–32	37·4	31·7	38·5	39·1

First of all, in this table the increase of suicide among females during the last thirty years is striking. Further, the share of Roman Catholic women has increased more strongly than that of the Protestant women. During the last years the figures in general come nearer to the half of the total, and consequently the deviation between the numbers of suicides of women and men becomes smaller. In considering the preceding, we have to take into account that the numbers are small and that an element of coincidence might influence these figures.

Mode of Suicide

It is also important to consider the way in which the suicide has been performed. It is evident from the table which follows that, for men as well as for women, hanging and strangling are the most frequent ways of suicide, but much more frequently among men than among the women, namely, in 48·5 and 26 per cent respectively of the total number of cases. Among women, cases of gas asphyxia and taking poison occur almost as often as hanging, namely, in 24 and 20 per cent of the cases, whereas for men the use of firearms occupies the second place with 13·5 per cent. It is further noticeable that, although the territory of our municipality is so abounding in water, suicide by drowning rather seldom occurs (7 and 13 per cent), which is in any case less than for the whole country.

The following figures from foreign countries, in comparison with the Netherlands, prove that generally the way of committing suicide is connected with national factors.

SUICIDE: METHOD (PERCENTAGES)

		Hanging	Drowning	Shooting	Stabbing	Fall or being Run Over	Gas Asphyxia	Taking Poison
Amsterdam	1905–30 M.	49	7	13	4	4	13	9
	1905–30 F.	26	13	1	4	12	24	20
The Netherlands	*1931–33 M.	51	19	9	3·5	3	9·5	3
	*1931–33 F.	27	39	1	3	4	15	9
Switzerland	1901–25 M.	43	15	27	4	5	2	3
	1901–25 F.	22	40	4	3	11	7	11
Berne	1911–25 M.	29	20	35	2	6	8	
	1911–25 F.	8	41	4	9	14	32	
Paris	1919–30	30	7	31	3	10	13	4
Cologne	1924–31 M.	28	12	27	10		18	5
	1924–31 F.	12	17	3	12		39	17
Hamburg	1930–33 M.	36	10	15	?	?	26	8·5
	1930–33 F.	16	10	2	?	?	49	16
Leipsic	1927–28 M.	38	8	15	3	8	25	3
	1927–28 F.	18	10	1	1	11	49	9
Vienna	1927–28 M.	30	5	20	2	4·5	29	8
	1927–28 F.	8	5	4	1	10	58	14
Budapest	1931–32	25	2	18	3	13	16	23
Prague	1926–29	37	9	21	2	11	8	12
Milan	1931–33	8	6	30	3	22	14	17
Naples	1931–33 M.	7	3	30	?	19	14	25
	1931–33 F.	—	—	3	1	19	3	74

* Statistics on the causes of decease.

That the way of committing suicide is indeed connected with national factors is proved by the high rates for hanging among men in the Netherlands as compared to the figures for shooting among men in Switzerland, Paris, the German and the Italian cities; also by the figures for gas asphyxia among women in the German towns and in Vienna and those for taking poison among women in Naples.

It is possible also for Holland to compare the different groups of municipalities, in order to state whether there exists a difference between the big and the small cities, in the way of committing suicide. For the years 1931–33 the following percentages have been found.

SUICIDE METHOD (PERCENTAGES)

Method	Municipalities with					Amsterdam
	Less than 5,000 Inhabitants	5,000–20,000 Inhabitants	20,000–50,000 Inhabitants	50,000–100,000 Inhabitants	Over 100,000 Inhabitants	
Hanging ..	56·1	53·7	41·1	31·0	29·4	25·5
Drowning ..	28·7	26·4	31·7	27·2	18·2	15·4
Firearms and stabbing ..	8·9	8·6	9·0	14·7	11·0	9·2
Fall	—	1·0	1·8	3·8	4·7	6·1
Crushing ..	0·9	1·9	2·0	1·6	1·4	2·2
Gas	1·6	4·0	10·6	14·7	25·3	34·2
Poison ..	3·3	3·0	3·2	5·4	8·8	6·6

The disparity between rural districts and the big cities is very striking. In rural districts hanging strongly preponderates, and as the municipality becomes larger the number of suicides committed in this way decreases. On the other hand, gas asphyxia hardly occurs in rural areas, and it increases with the extent of the municipality; for Amsterdam it is the most important cause. The number of cases of throwing oneself out of the window also increases with the extent of the municipality, and thus with the fact of the houses being higher. Drowning relatively happens most frequently in the municipalities with 20,000 to 50,000 inhabitants.

In regard to age, there exists a difference in the way of committing suicide. The high percentage (41·8) for taking poison among women between 20 and 29 strikes us, and the high per-

centage for hanging (58·8) among men under 20 years. Among old men, too, hanging occupies a big place (60 per cent).

Motive

Finally, the motive of the suicide is of importance. Till now it has not been possible to gather some data for Amsterdam about this matter. In the following table we give the figures for the whole country in comparison with France and Switzerland.

Motives	The Netherlands, 1927–32		France, 1919–22	Switzerland, 1921–25	
	Number of Cases	Percentage of the Total	Percentage	Males, Percentage	Females Percentage
Melancholy, despondency, weariness of life	1,871	62	27	8	8
Illness	113	4		11	9
Madness, neuropathy, etc. ..	529	17	22	31	63
Financial difficulties	194*	7	11	10	4
Abuse of alcohol	56	2	10	28	5
Love affairs	52	2	5	3	5
Fear of punishment, etc. ..	59	2	2	4	2
Domestic troubles	48	2	?		
Questions with employers, dismissal, etc.	22	1	1		
Decease of husband or wife ..	15	1	14		
Other motives			8	5	4

* Of which 57 poverty.

If we compare the percentages, it appears that the persons charged with the inquiry about the motives in a case of suicide apply very subjective considerations. It suffices to look at the figures for weariness of life and madness in the Netherlands, 62 and 17 per cent, 8 and 63 in Switzerland, and 27 and 22 in France.

In the Dutch statistics the influence of the economic crisis on the number of suicides is undeniable; the number of suicides as the consequence of financial difficulties, for instance, increased from 17 and 18 in the years 1927 and 1928 to 28, 23, 37, and 68 in the consecutive years afterwards.

For the appreciation of the motives it is certainly important to read a communication in the statistics of admission in hospitals of the Amsterdam municipal medical service, namely,

that out of the 155 and 178 persons admitted in a hospital during the years 1933 and 1934 on account of attempt of suicide, according to the definitive diagnosis of the hospital, 81 and 103 appeared to suffer from psychoses, 17 and 10 from hysteria, etc., 5 and 3 from epilepsy, 9 and 8 from arterio-sclerosis, 5 and 3 from alcoholism, from which fact it appears that in stating the motive of suicide it has to be taken into consideration whether the attempt has not to be put into relation with one of the states of disease just mentioned.

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QUELQUES REMARQUES SUR DES STATISTIQUES DEMOGRAPHIQUES RELATIVES AUX JUIFS

Par GRZEGORZ FRUMKIN

Les progrès réalisés au cours des récentes années dans l'analyse de la situation démographique des divers pays et l'effort déployé afin de déceler les perspectives de leur évolution future nécessitent un matériel statistique complexe. A l'instar du naturaliste muni d'un microscope, le sociologue-statisticien examinera le germe qui lui permettra de connaître le développement ultérieur de l'organisme. Il tiendra donc compte des facteurs les plus divers qui différencient les groupes humains. La confession, ou la communauté religieuse, retiendra ainsi également son attention. Il constatera toutefois avec regret que les statistiques de certains pays ne contiennent pas de données séparées selon la confession. Quelle que soit l'opinion que l'on puisse avoir sur l'esprit laïque qui a prévalu à ce sujet, il est certain qu'il nous prive d'éléments précieux pour des analyses démographiques. La religion peut être considérée comme relevant de la conscience individuelle, mais les groupements de gens de même religion peuvent posséder des traits sociaux ou économiques propres. Le facteur religion joue un rôle important dans l'étude de la fertilité différentielle; il devrait pouvoir être isolé au même titre que l'âge, la race, l'éducation, la situation économique, etc.

Les statistiques relatives au mouvement naturel des Juifs non seulement permettraient de suivre l'évolution numérique des Juifs dans les différents pays, mais faciliteraient une analyse démographique des populations qui contiennent des groupes juifs distincts et suffisamment importants. Tel est notamment le cas de la Pologne, de la Tchécoslovaquie et de la Roumanie, où les Juifs habitent surtout les villes et accusent une structure professionnelle et sociale particulières. Même dans les pays occidentaux ils se concentrent dans certains quartiers des villes plutôt que dans d'autres et y forment une proportion élevée, sinon la majorité, de la population, par exemple Londres, Amsterdam. On tiendra donc compte de ce facteur, qu'il s'agisse d'étudier l'influence de l'urbanisation sur le mouvement de la population d'un pays ou de faire une analyse statistique portant sur une ville. A ce propos, et à moins qu'il ne s'agisse d'une étude biologique, il peut paraître indifférent que l'on considère les Juifs

comme race ou comme communauté religieuse ou culturelle. Le cas est nettement distinct de celui des races différentes, mais de religions communes ou rapprochées, comme par exemple aux Etats-Unis: là, une différence statistique entre des blancs protestants et des nègres catholiques s'expliquera en premier lieu par la différence de race et non pas de croyance.

Certains auteurs affirment, sur la base de statistiques, que les taux de natalité des Juifs dans les différents pays sont inférieurs à ceux de leurs concitoyens.[1]

Une comparaison entre ces taux et les taux correspondants en Palestine invite à supposer qu'il existe un nouveau dynamisme démographique parmi les Juifs revenus dans la Terre promise. Le taux bas de leur mortalité générale agit dans le même sens. Le statisticien tiendra toutefois compte du fait qu'à la suite de l'immigration, la structure par âge de la population juive en Palestine est exceptionnellement favorable à une forte natalité et à une faible mortalité. Les deux problèmes doivent être posés plutôt de la manière suivante: (1) Quelles sont, à conditions égales, la fertilité et la mortalité des Juifs par rapport aux autres couches de la population (par exemple pour les mêmes groupes d'âges, dans les mêmes couches économiques et sociales, etc.)? (2) Est-ce que les Juifs qui ont immigré en Palestine sont plus prolifiques et moins exposés aux risques de la mort qu'ils n'auraient été dans le pays d'où ils sont venus?

La tâche du statisticien qui veut procéder à une analyse des données est toutefois rendue très malaisée, non seulement à cause des difficultés provenant de facteurs économiques et sociaux propres à des masses juives, mais parfois aussi en raison de l'insuffisance du matériel statistique. De pareilles comparaisons devraient logiquement porter en premier lieu sur des pays où les Juifs forment des masses compactes et bien distinctes du reste de la population (évidemment de fait et non seulement par définition légale). Mais il se trouve que justement dans certains de ces pays les statistiques disponibles sont ou défectueuses, ou trop peu détaillées. Ainsi, par exemple, nous savons, grâce à plusieurs études parues en Pologne, que des statistiques relatives

[1] Par exemple, Carr-Saunders, dans son excellent livre *World Population* (Oxford, 1936), p. 308: "But it is an almost invariable rule that the Jewish birth-rate is lower than the surrounding birth-rate." Carr-Saunders s'est basé lui-même sur des statistiques publiées pour un grand nombre de pays par Ruppin (*Les Juifs dans le Monde moderne*). Il résulte de ce qui suit que certaines statistiques citées par Ruppin sont erronées.

au mouvement naturel des juifs polonais sont en partie pratiquement inutilisables.[1]

L'intérêt de ces recherches dépasse nettement le cadre des statistiques polonaises et même des statistiques juives, car les constatations faites pour la Pologne s'appliquent probablement dans une certaine mesure également à d'autres pays possédant des populations—qu'elles soient juives, musulmanes ou autres—pour lesquelles des statistiques sont plus défectueuses que pour le reste du pays. Grâce à leur esprit critique et à leur probité scientifique, les auteurs apportent à ces recherches une précieuse contribution de portée générale.

C'est surtout en examinant les données séparées par villes ou par provinces qu'on est frappé du caractère défectueux de l'enregistrement du mouvement de la population juive en Pologne. Ainsi la proportion entre les naissances masculines et les naissances féminines atteint parfois des taux fantaisistes, de 150 et même de 200 %. Il n'est pas étonnant que la proportion contraire s'observe parfois dans le cas d'enregistrements tardifs, c'est-à-dire afférents à des naissances survenues au cours d'années antérieures; ainsi, les inscriptions à l'état civil d'enfants atteignant l'âge scolaire accusent parfois un fort excédent de filles par rapport aux garçons. La prédominance d'inscriptions de nouveaux-nés de sexe masculin s'explique aisément chez les Juifs, comme du reste chez les musulmans, par le caractère des cérémonies religieuses qui ont lieu à l'occasion de la naissance d'un garçon.

Tandis que le taux de naissances en 1931–32 a été pour les catholiques de la Polésie (province de l'est de la Pologne) de 33·8 ‰ et même de 40·3 ‰ pour les orthodoxes, il n'a été pour les Juifs que de 18·2 ‰; le taux de décès des Juifs n'aurait été

[1] Voir tout particulièrement:

(1) *Problèmes démographiques de la Pologne* (Statistique de la Pologne, Série C, fasc. 41, Varsovie, 1936; publié par l'Office Central de Statistique sous le titre *Zagadnienia demograficzne Polski*), partie II: *Exactitude dans l'enregistrement des naissances et des décès*, par Stefan Szulc.

(2) S. Fogelson: *Le mouvement naturel de la population en Polésie* (publié en polonais sous le titre: *Ruch naturalny ludności nu Polesiu*, Warszawa, 1936, Instytut Badań Spraw Narodowościowych).

(3) Du même auteur et dans la même édition: *L'augmentation naturelle de la population juive en Pologne* (publié sous le titre *Przyrost naturalny ludności żydowskiej w Polsce*, Warszawa, 1937).

Le (2) ci-dessus a paru également dans la revue *Sprawy narodowościowe* (Problèmes de nationalités), vol. X, No. 4–5; le (3) dans le vol. XI de la même revue.

que de 8·8 ‰ contre 13·4 ‰ pour les catholiques et 16·6 ‰ pour les orthodoxes. La mortalité infantile dans la même province n'aurait été en 1933 pour les Juifs que de 44 ‰ contre 104 pour les catholiques, 111 pour les orthodoxes et 203 ‰ pour les protestants. Comme il n'y a pas de raisons d'admettre chez les protestants de cette province une mortalité infantile plus élevée que celle des autres confessions, on peut en déduire que chez eux l'enregistrement est plus complet que chez leurs concitoyens des autres confessions. Le niveau de cette mortalité chez les protestants permet peut-être de se rendre compte de l'énormité des lacunes dans les données correspondantes relatives aux Juifs.

De manière générale, on peut dire que l'enregistrement du mouvement naturel de la population juive en Pologne est à tel point incomplet que ces données ne peuvent guère être utilisées pour des comparaisons dans le temps ou dans l'espace. Le taux de natalité des Juifs dans toute la Pologne en 1931–35 a été de 19·3 ‰ contre 27·6 ‰ pour les catholiques et 31·9 ‰ pour les orthodoxes. On pourrait supposer, à première vue, que ce taux si bas chez les Juifs s'explique, entre autre, par leur urbanisation. Mais leur taux de mortalité, qui n'était que de 9·8 ‰, met en évidence le caractère incomplet de l'enregistrement.

Les chiffres suivants montrent l'évolution des taux depuis 1921:

	Pologne		dont Juifs	
	Naissances	Décès	Naissances	Décès
	‰	‰	‰	‰
1921–25	34·7	18·5	22·1	10·1
1926–30	32·3	16·8	20·8	10·5
1931–35	27·6	14·6	19·3	9·8
1936	26·2	14·2	19·3	10·1

Tandis que les taux pour toute la Pologne accusent, comme il fallait s'y attendre, une baisse sensible, ceux relatifs à la population juive sont restés plus stables. Toutefois, il ne faudrait pas en conclure que l'enregistrement, en ce qui concerne les Juifs, s'améliore. Ce sont plutôt les enregistrements tardifs de naissances et de décès survenus au cours des années précédentes qui ont augmenté.

Ces enregistrements tardifs représentent une fraction importante

de tous les enregistrements. Il n'est pas rare qu'on naisse officiellement au moment d'entrer à l'école ou au moment du mariage, à moins que ce ne soit à la mort. Ainsi, les 31,630 inscriptions prétendument relatives à l'année 1932, de naissances juives dans les provinces centrales, à l'exclusion de la capitale, se décomposent comme suit:

nés en 1932 et enregistrés en 1932	12,452
nés en 1932 et enregistrés dans les premiers six mois de 1933	1,818
nés avant 1932 et enregistrés en 1932	17,360
Total représentant soi-disant 1932	31,630

Cet exemple montre que si les données relatives à des années particulières sont fortement incomplètes, elles contiennent d'autre part une forte proportion d'enregistrements de naissances survenues au cours d'années précédentes. En fait, le nombre des naissances non enregistrées ou se référant à une autre année est de beaucoup plus élevé que celui des naissances survenues et enregistrées au cours de la même année. Un grand nombre de naissances enregistrées tardivement ne se réfère nullement à des années récentes: ainsi parmi les 17,360 enregistrements tardifs de 1932, environ 6,000 se référaient à l'année 1919 et avant!

Il paraît résulter de la comparaison entre les chiffres officiels et ceux d'une enquête faite par l'Association pour la Protection de la Santé de la population juive que le nombre des naissances juives enregistrées dans les provinces centrales devrait être augmenté de 60 à 80 % et peut-être même davantage. Autant dire que les chiffres originaux ne peuvent pas servir à grand chose.

Il est possible de contrôler les résultats ci-dessus sur la base du recensement de 1931: il n'y a qu'à calculer à l'aide des tables de mortalité, combien d'enfants nés au cours d'une certaine année précédant le recensement auront survécu à la date du recensement. Si le chiffre obtenu est inférieur au chiffre du recensement, il est probable que l'enregistrement des naissances a été incomplet. Il résulte de cette comparaison qu'il faudrait "corriger" les chiffres enregistrés pour chaque année, par des coefficients pouvant atteindre, selon les provinces, 80 %. Le mouvement migratoire aurait pu troubler les résultats, mais dans le cas présent il ne peut les invalider, bien au contraire: au cours des années précédant le recensement, il y eut un fort courant d'émigration.

Par un calcul d'ajustement des données pour les différentes provinces Fogelson obtient pour 1931–35 un taux de naissances juives dépassant 26 ‰—le taux officiel n'étant que de 19·3 ‰—c.a.d. presque le même que celui des catholiques (27·6). Tenant compte du caractère urbain de la population juive, ce taux est relativement élevé.

Des taux de mortalité infantile descendant à presque 50 ‰ (par 1,000 naissances), c.a.d. sensiblement au-dessous du niveau qu'accuse le Royaume-Uni, sont de toute évidence également à rejeter. Il est probable que les 3/4 environ sinon les 4/5 de ces décès échappent à l'enregistrement. En corrigeant les données de mortalité infantile, l'on obtient pour 1931–35 chez les Juifs un taux de mortalité générale proche de 13 ‰, en regard du taux officiel de 9·8 ‰.

Il ressort de ces calculs que l'enregistrement des naissances est plus incomplet que celui des décès. Ce fait n'est pas inattendu, car on le constate dans presque tous les pays où l'enregistrement est défectueux. Le vrai taux d'augmentation naturelle de la population juive en Pologne est par conséquent plus élevé que celui découlant des chiffres officiels, probablement entre 12 et 13 ‰ au lieu de 9·5 ‰, années 1931–35.

La marge d'erreur de toute "correction" de ces données est nécessairement élevée. Néanmoins, ces calculs, s'ils ne peuvent prétendre à une très grande exactitude, donnent une indication précieuse sur le caractère trompeur de certaines données officielles et permettent d'éviter maintes conclusions erronées.

Il serait intéressant de connaître pour d'autres pays des analyses semblables à celles des deux auteurs cités.

DEATH OF PROFESSOR ERNEST MAHAIM

We have to announce, with great regret, the death at Liége on December 1, 1938, at the age of seventy-three, of Professor Ernest Mahaim, the eminent sociologist and student of population problems. He had been Belgian Minister of Labour, and was Emeritus Professor at the University of Liége. In 1927, after the very successful Population Conference at Geneva, he was appointed one of the original members of the provisional committee which was set up to organize a permanent international body to investigate population matters, and from the labours of this committee there sprang the International Population Union. He was elected a Vice-President of the Union, and was re-elected to this position in 1935 and in 1937, on the latter occasion when he attended the International Population Congress at Paris. His colleagues will always remember his friendly reception of them, some years ago, at the Institut de Sociologie Solvay, in the Parc Léopold at Brussels, where a meeting was held by the Executive Committee of the Union to discuss business matters. He was, in fact, a clear-headed man of business, and was always very cheerful and pleasant to work with. His colleagues on the Executive Committee of the International Union, and the members of the Union generally, will feel his loss greatly.

C. F. Arden-Close.

INTERNATIONAL POPULATION CONGRESS PARIS, 1937

We must apologize for a misstatement in the last number of the Journal, Vol. II, No. 4, August 1938, where we said that Monsieur Zay presided over the inaugural session. Our President, Monsieur Landry, who was President of the Organizing Committee of the Congress and of its Bureau, presided over the inaugural session.

We are happy to state that, in a reasonably short time, the eight volumes of the Proceedings of the Congress have been issued from Hermann et Cie, 6, Rue de la Sorbonne, Paris. The arrangement of the volumes is as follows:—

Tome I. Théorie générale de la population. *50 francs.*
Tome II. Démographie historique. *25 francs.*
Tome III. Démographie statistique: études d'ensemble. *30 francs.*
Tome IV. Démographie statistique: études spéciales (état de la population; migrations). *30 francs.*
Tome V. Démographie statistique: études spéciales (nuptialité; natalité; mortalité). *45 francs.*
Tome VI. Démographie de la France d'outremer. *30 francs.*
Tome VII. Facteurs et conséquences de l'évolution démographique. *40 francs.*
Tome VIII. Problèmes qualitatifs de la population. *50 francs.*

One is impressed by these eight large volumes, and certainly the complete Proceedings do comprise a valuable collection of material on Population Problems. Those responsible for the arrangements for printing are to be congratulated on the form in which the various papers have been disposed. When one realizes that the papers are in different languages, and that charts, maps, tables, and mathematical formulae are included, one is immediately struck by the cheapness of the volumes offered. The eight volumes contain 1,525 pages.

It is understood that the cost of publication has been borne by the French Committee which organized the Congress, some monies having been raised for this purpose. The funds of the Union have not been used.

POPULATION

Journal of the International Union for the Scientific Investigation of Population Problems (Journal de l'Union Internationale pour l'Étude scientifique des Problèmes de la Population).

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The Executive Committee of the Union and the Editor of the Journal wish it to be understood that the Union is not responsible for the statements or opinions expressed in the papers published in the Journal.

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THIS volume of Proceedings is the first to be published under the auspices of the International Union for the Scientific Investigation of Population Problems since it was inaugurated in 1928. It contains the full text of all scientific papers read at the London Meeting of the Second General Assembly in June 1931. Communications made in the French and German languages are followed by abstracts in English. All discussions are in English.

The first World Population Congress, which led to the formation of the International Union, was held at Geneva from August 29th to September 3rd in 1927. The world-wide interest shown on that occasion may have prepared for this volume of scientific papers a circle of readers wider than that confined to those who approach the study from any specialized technical aspect.

Some Press Opinions

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